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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 8, 1987 Volume 1082 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 4, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,468,815 through 4,470,154
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 21, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,388,733	06/268,653	6/21/83
4,388,739	06/234,806	6/21/83
4,388,741	06/219,827	6/21/83
4,388,742	06/299,266	6/21/83
4,388,747	06/291,283	6/21/83
4,388,762	06/290,024	6/21/83
4,388,763	06/234,875	6/21/83
4,388,764	06/328,013	6/21/83
4,388,766	06/293,495	6/21/83
4,388,770	06/307,004	6/21/83
4,388,772	06/224,318	6/21/83
4,388,774	06/227,750	6/21/83
4,388,776	06/260,692	6/21/83
4,388,799	06/360,539	6/21/83
4,388,805	06/226,915	6/21/83
4,388,808	06/349,494	6/21/83
4,388,812	06/252,937	6/21/83
4,388,824	06/238,095	6/21/83
4,388,831	06/236,086	6/21/83
4,388,837	06/393,102	6/21/83
4,388,854	06/238,313	6/21/83
4,388,861	06/265,749	6/21/83
4,388,863	06/323,941	6/21/83
4,388,873	06/259,279	6/21/83
4,388,876	06/251,397	6/21/83
4,388,878	06/312,631	6/21/83
4,388,879	06/263,686	6/21/83
4,388,881	06/271,788	6/21/83
4,388,886	06/331,692	6/21/83
4,388,889	06/248,389	6/21/83
4,388,899	06/244,896	6/21/83
4,388,904	06/253,008	6/21/83
4,388,910	06/276,000	6/21/83
4,388,917	06/225,643	6/21/83
4,388,918	06/270,904	6/21/83
4,388,936	06/360,599	6/21/83
4,388,937	06/298,776	6/21/83
4,388,939	06/272,535	6/21/83
4,388,943	06/261,242	6/21/83
4,388,954	06/264,023	6/21/83
4,388,961	06/227,409	6/21/83
4,388,966	06/329,938	6/21/83
4,388,970	06/236,144	6/21/83
4,388,974	06/253,462	6/21/83
4,388,978	06/230,017	6/21/83
4,388,993	06/228,114	6/21/83
4,388,995	06/271,472	6/21/83
4,389,001	06/263,178	6/21/83
4,389,004	06/284,221	6/21/83
4,389,008	06/304,512	6/21/83
4,389,016	06/258,960	6/21/83
4,389,025	06/216,656	6/21/83
4,389,031	06/290,408	6/21/83
4,389,036	06/256,064	6/21/83
4,389,041	06/426,619	6/21/83
4,389,051	06/398,359	6/21/83
4,389,060	06/231,418	6/21/83
4,389,062	06/216,722	6/21/83
4,389,065	06/315,042	6/21/83
4,389,067	06/224,633	6/21/83
4,389,099	06/283,459	6/21/83
4,389,103	06/286,520	6/21/83
4,389,130	06/366,563	6/21/83
4,389,133	06/241,661	6/21/83
4,389,145	06/297,777	6/21/83
4,389,152	06/297,989	6/21/83
4,389,169	06/241,238	6/21/83
4,389,173	06/364,286	6/21/83
4,389,180	06/277,279	6/21/83
4,389,182	06/343,307	6/21/83
4,389,192	06/257,916	6/21/83
4,389,201	06/231,655	6/21/83
4,389,210	06/307,978	6/21/83
4,389,211	06/269,361	6/21/83
4,389,215	06/305,568	6/21/83
4,389,216	06/355,309	6/21/83
4,389,224	06/283,423	6/21/83
4,389,258	06/334,624	6/21/83
4,389,263	06/310,173	6/21/83
4,389,265	06/283,709	6/21/83
4,389,272	06/285,558	6/21/83
4,389,274	06/246,529	6/21/83
4,389,276	06/270,678	6/21/83
4,389,277	06/270,679	6/21/83
4,389,284	06/334,966	6/21/83
4,389,308	06/322,906	6/21/83
4,389,311	06/283,992	6/21/83

Patent Number	Serial Number	Issue Date
4,389,315	06/286,563	6/21/83
4,389,319	06/257,460	6/21/83
4,389,321	06/334,860	6/21/83
4,389,326	06/272,943	6/21/83
4,389,353	06/394,519	6/21/83
4,389,359	06/244,579	6/21/83
4,389,367	06/306,948	6/21/83
4,389,386	06/305,058	6/21/83
4,389,388	06/351,051	6/21/83
4,389,405	06/223,159	6/21/83
4,389,406	06/263,927	6/21/83
4,389,410	06/285,612	6/21/83
4,389,415	06/285,215	6/21/83
4,389,416	06/310,164	6/21/83
4,389,417	06/336,107	6/21/83
4,389,425	06/272,738	6/21/83
4,389,427	06/330,856	6/21/83
4,389,430	06/318,913	6/21/83
4,389,449	06/219,090	6/21/83
4,389,469	06/308,098	6/21/83
4,389,494	06/283,546	6/21/83
4,389,501	06/319,633	6/21/83
4,389,504	06/308,201	6/21/83
4,389,519	06/321,926	6/21/83
4,389,530	06/352,723	6/21/83
4,389,545	06/220,359	6/21/83
4,389,561	06/277,989	6/21/83
4,389,578	06/255,393	6/21/83
4,389,583	06/271,398	6/21/83
4,389,588	06/361,336	6/21/83
4,389,589	06/289,194	6/21/83
4,389,602	06/236,231	6/21/83
4,389,603	06/233,692	6/21/83
4,389,642	06/279,323	6/21/83
4,389,674	06/240,660	6/21/83
4,389,695	06/232,540	6/21/83
4,389,697	06/288,807	6/21/83
4,389,731	06/254,849	6/21/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,897,892, Re. S.N. 063,930, Filed June 19, 1987, Cl. 223/66, CUSTOM FORMED WIG BLOCK, James L. Waters, Owner of Record: *Inventor,* Attorney or Agent: Robert M. Schwartz, et al., Ex. Gp.: 247

4,033,280, Re. S.N. 075,849, Filed July 20, 1987, Cl. 114/255, LIVE WELL FOR HIGH SPEED OPEN FISHING BOAT, Forrest L. Wood, et al., Owner of Record: *Wood Manufacturing Co., Inc., Flippin, Ariz.,* Attorney or Agent: Edward J. Lynch, et al., Ex. Gp.: 315

4,074,737, Re. S.N. 049,803, Filed May 14, 1987, Cl. 144/117.R, WOOD PLANER CUTTERHEAD DESIGN FOR REDUCED NOISE LEVEL, John S. Stewart, Owner of Record: *Noise Control Service, Inc.,* Attorney or Agent: Floyd A. Gibson, et al., Ex. Gp.: 321

4,471,114, Re. S.N. 051,271, Filed Sept. 6, 1986, Cl. 536/127, SEPARATION OF MANNOSE BY SELECTIVE ADSORPTION ON ZEOLITIC MOLECULAR SIEVES, John D. Sherman, et al., Owner of Record: *Union Carbide Corp., Danbury, Conn.,* Attorney or Agent: James C. Arvantes, et al., Ex. Gp.: 123

4,480,079, Re. S.N. 924,807, Filed Oct. 30, 1986, Cl. 526/301, COMPOLYMERIZATION OF UNSATURATED URETHANE MONOMERS, Michael L. Orton, Owner of Record: *Imperial Chemical Industries, London, England,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 155

4,486,829, Re. S.N. 938,034, Filed Dec. 4, 1986, Cl. 364/200, METHOD AND APPARATUS FOR DETECTING A FAULTY COMPUTER IN A MULTICOMPUTER SYSTEM, Kinji Mori, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 237

4,508,996, Re. S.N. 034,436, Filed Apr. 2, 1987, Cl. 315/224, HIGH FREQUENCY SUPPLY SYSTEM FOR GAS DISCHARGE LAMPS AND ELECTRONIC BALLAST THEREFOR, John C. Clegg, et al., Owner of Record: *Brigham Young University, Provo, Utah,* Attorney or Agent: H. Ross Workman, Ex. Gp.: 266

4,510,883, Re. S.N. 039,158, Filed Apr. 16, 1987, Cl. 118/305, APPARATUS FOR DISTRIBUTING POWDERED MATERIAL, Donald C. Estes, Owner of Record: *Speedco, Inc., Winchester, Ky.,* Attorney or Agent: James R. Higgins, Jr., Ex. Gp.: 152

4,513,072, Re. S.N. 045,017, Filed Sept. 24, 1986, Cl. 430/57, DUAL LAYER ELECTROPHOTOGRAPHIC RECORDING MATERIAL CONTAINING A LAYER OF SELENIUM ARSENIC AND HALOGEN, AND THEREABOVE A LAYER OF SELENIUM AND TELLURIUM, Hartmut Dulken, et al., Owner of Record: *Licentia Patent-Verwattungs-GmbH, Frankfurt, Germany,* Attorney or Agent: George H. Spencer, et al., Ex. Gp.: 156

4,518,017, Re. S.N. 052,054, Filed May 21, 1987, Cl. 138/96R, PROTECTIVE COVER ASSEMBLY, Erin D. Hennon, et al., Owner of Record: *Dana Corp., Toledo, Ohio,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 243

4,531,158, Re. S.N. 074,938, Filed July 17, 1987, Cl. 358/227, AUTOMATIC FOCUSING SYSTEM FOR VIDEO CAMERAS, Toshio Murakami, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 262

4,541,712, Re. S.N. 075,175, Filed July 20, 1987, Cl. 355/53, LASER PATTERN GENERATING SYSTEM, Theodore R. Whitney, Owner of Record: *American Semiconductor Equipment Technologies, Woodland Hills, Calif.,* Attorney or Agent: Alan H. MacPherson, et al., Ex. Gp.: 211

4,556,483, Re. S.N. 079,628, Filed July 30, 1987, Cl. 209/160, NEUTRAL HYDROCARBOXY CARBONYL THIOUREA SULFIDE COLLECTORS, Yun-Lung Fu, Owner of Record: *American Cyanamid Co., Stamford, Conn.,* Attorney or Agent: Frank M. Van Riet, Ex. Gp.: 312

4,564,885, Re. S.N. 077,636, Filed July 24, 1987, Cl. 361/436, RECTIFIER WITH SLUG CONSTRUCTION AND MOLD FOR FABRICATING SAME, T. Michael McCann, Owner of Record: *General Instrument Corp.,* Attorney or Agent: Harold James, et al., Ex. Gp.: 211

4,581,929, Re. S.N. 038,703, Filed Apr. 15, 1987, Cl. 73/204, AIR FLOW METER CIRCUIT WITH TEMPERATURE COMPENSATION CIRCUIT, Noboru Sugiuro, Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 268

4,599,118, Re. S.N. 053,269, Filed May 21, 1987, Cl. 148/1.5, METHOD OF MAKING MOSFET BY MULTIPLE IMPLANTATIONS FOLLOWED BY A DIFFUSION STEP, Yu-Pin Han, et al., Owner of Record: *Mostek Corp., Carollton, Tex.,* Attorney or Agent: Roland Plottel, et al., Ex. Gp.: 114

4,623,860, Re. S.N. 075,356, Filed July 20, 1987, Cl. 335/170, LATCHING SOLENOID MECHANISM,

Keith F. Baker, et al., Owner of Record: *Synchro-Start Products, Inc., Skokie, Ill.*, Attorney or Agent: Thomas E. Dorn, et al., Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Dockside Research, Inc., New York, N.Y., Reg. No. 895,821, for the mark "TIE GARD", Canc. No. 16,238.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Turbine Legal Operation, 1 River Rd., Schenectady, N.Y. 12345.

4,597,676. HYBRID BEARING.
4,615,734. SOLID PARTICLE EROSION RESISTANT COATING UTILIZING TITANIUM CARBIDE, PROCESS FOR APPLYING AND ARTICLE COATED THEREWITH.
4,622,116. PROCESS FOR ELECTRODEPOSITING MICA ON COIL OR BAR CONNECTIONS AND RESULTING PRODUCTS.
4.624.586. BEARING LUBRICATION DEVICE.
4,648,793. TURBINE WHEEL KEY AND KEYWAY VENTILATION.
4,659,954. CARBON BRUSHES IN SEALED SILICONE ENVIRONMENT WITH CONTROLLED VAPOR PRESSURE.
4,668,161. VENTILATION OF TURBINE COMPONENTS.

D. 241,743. COMBINED PENCIL SHARPENER AND CLIP, *Mark Lemieux*, 131 Wilding Ave., Sault Ste. Marie, Ontario, Canada P6A-4V2; (705) 949-1802.

3,878,539. PORTABLE ALARM DEVICE FOR HOME, OFFICE AND TRAVEL. ADJUSTABLE SLIDE-BRACKET HOOKS OVER DOOR TOPS IN SECONDS, *Chadyeane Gooding*, 3100-A Spring Hill Rd., Smyra, Ga. 30080.

3,996,987. CONVERTIBLE VALENCE, *Edith Rodriguez*, Box 2576, St. Thomas, U.S. Virgin Islands 00801.

4,649,676. SHELTER CONSTRUCTION, *C. Regina Davey*, c/o Frederick L. Bergert, Law Offices, Nies, Webner, Kurz & Bergert, Suite 700, 1911 Jefferson Davis Hwy., Arlington, Va. 22202.

4,673,868. METHOD OF TESTING ELECTRONIC AUTOMOTIVE PARTS, *Rolin Jones, Jr.*, c/o Reginald F. Roberts, Jr., 1422 Hearthstone Dr., P.O. Box 515, Baton Rouge, La. 70820.

4,686,878. NEW ORLEANS WIND CHIME, *Barbara A. Hebert*, 812 Cameron Ct., Kenner, La. 70065.

S.N. 723,260. CENTER STERN OUTBOARD MOTOR FOR DOUBLE-END CANDES, *Richard E. Zeimet*, Taichung, P.O. Box 149, 40099 Taiwan, Republic of China.

S.N. 947,370. WIND DRIVEN VENTILLATING DEVICE, *Emirto T. Cruz*, 12312 Cloudview Ave., NE., Albuquerque, N. Mex. 87123.

PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Meeting Date

The meeting date is Sept. 16, 1987. The date given in the prior Official Gazette notice published Aug. 25, 1987, is in error.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 8, 1987

Bl. 4,351,172	4,611,015	4,643,481	4,656,512
Re. 31,935	4,612,524	4,644,439	4,656,609
Re. 32,349	4,613,402	4,644,696	4,656,786
Re. 32,390	4,615,360	4,645,566	4,658,304
Re. 32,404	4,616,662	4,645,631	4,658,755
D. 287,227	4,618,518	4,646,110	4,659,274
4,326,940	4,619,820	4,646,175	4,659,283
4,482,365	4,623,504	4,646,722	4,659,385
4,493,783	4,623,702	4,646,784	4,659,701
4,513,699	4,624,195	4,647,143	4,659,882
4,520,913	4,625,405	4,647,208	4,660,803
4,531,026	4,626,289	4,647,402	4,660,860
4,540,448	4,626,921	4,647,459	4,661,093
4,547,411	4,627,414	4,647,740	4,661,097
4,551,175	4,628,043	4,647,952	4,661,379
4,552,960	4,628,194	4,648,136	4,661,534
4,566,962	4,628,427	4,648,575	4,661,790
4,566,985	4,628,912	4,649,069	4,662,367
4,567,187	4,629,720	4,649,252	4,662,791
4,575,778	4,629,773	4,649,735	4,663,144
4,576,633	4,630,374	4,649,875	4,663,172
4,582,842	4,631,356	4,650,086	4,663,313
4,585,605	4,631,488	4,650,302	4,663,512
4,586,101	4,631,707	4,650,361	4,664,333
4,588,661	4,634,407	4,650,803	4,664,742
4,588,679	4,634,752	4,651,419	4,664,774
4,591,858	4,634,975	4,651,566	4,664,977
4,593,852	4,635,078	4,651,623	4,666,689
4,594,379	4,635,570	4,652,270	4,667,598
4,594,940	4,636,147	4,652,495	4,667,903
4,596,875	4,637,327	4,652,694	4,668,493
4,597,711	4,637,843	4,652,986	4,668,774
4,598,256	4,638,192	4,653,446	4,669,465
4,598,292	4,639,153	4,654,156	4,670,027
4,598,842	4,639,836	4,654,464	4,670,498
4,599,439	4,640,543	4,654,510	4,671,005
4,601,171	4,640,588	4,654,651	4,671,038
4,601,868	4,640,839	4,655,106	4,671,273
4,602,058	4,640,957	4,655,417	4,671,825
4,604,171	4,641,228	4,655,640	4,672,254
4,605,809	4,641,783	4,655,642	4,677,958
4,606,772	4,641,954	4,655,752	4,681,119
4,607,071	4,642,011	4,655,829	4,681,996
4,607,098	4,642,581	4,656,181	
4,608,391	4,642,771	4,656,299	

Disclaimers

4,118,241.—*Frank E. Bernett*, Yardley, Pa. MORTAR COMPOSITIONS AND METHOD OF MAKING SAME. Patent dated Oct. 3, 1978. Disclaimer filed June 30, 1987, by the assignee, *Tile Council of America.*

Hereby enters this disclaimer to claims 1, 3, 4, 5 and 6 of said patent.

4,409,481.—*Harry D. Smith, Jr.*; *Ward E. Schultz* and *Jerry L. Verbout*, all of Houston, Tex. METHOD FOR SIMULTANEOUS MEASUREMENT OF THERMAL NEUTRON DECAY COMPONENTS. Patent dated Oct. 11, 1983. Disclaimer filed June 10, 1987, by the assignee, *Halliburton Co.*

The term of this patent subsequent to June 14, 2000 has been disclaimed.

4,424,444.—*Harry D. Smith, Jr.* and *Dan M. Arnold*, Houston, Tex. METHOD FOR SIMULTANEOUS MEASUREMENT OF BOREHOLE AND FORMATION NEUTRON LIFETIMES. Patent dated Jan. 3, 1984. Disclaimer filed June 10, 1987, by the assignee, *Halliburton Co.*

The term of this patent subsequent to June 14, 2000 has been disclaimed.

4,536,263.—*Oronzio deNora*, Milan, Italy and *Placido M. Spaziante*, Lugano, Switzerland. PROCESS FOR GENERATING HALOGEN USING NOVEL ELECTROLYSIS CELL. Patent dated Aug. 20, 1985. Disclaimer filed May 8, 1987, by the assignee, *Oronzio deNora Technologies, Inc.*

The term of this patent subsequent to July 20, 1999 has been disclaimed.

4,561,958.—*Douglas V. Stewart*, Florence and *Alton T. Tabereaux*, Sheffield, both of Ala. ALUMINA REDUCTION CELL. Patent dated Dec. 31, 1985. Disclaimer filed June 12, 1987, by the assignee, *Reynolds Metals Co.*

Hereby enters this disclaimer to all claims of said patent.

4,562,243.—*Virgil Percec*, Shaker Heights, Ohio. CROSS-LINKABLE DIFUNCTIONALIZED POLYARYLENE POLYETHERS. Patent dated Dec. 31, 1985. Disclaimer filed June 15, 1987, by the assignee, *The B. F. Goodrich Co.*

Hereby enters this disclaimer to claim 1 of said patent.

4,572,428.—*Gordon S. Groff*, Lancaster; *Dean S. Herr*, Willow Street, both of Pa. IN DUCT ATOMIZING HUMIDIFICATION AND EVAPORATIVE COOLING SYSTEM. Patent dated Feb. 25, 1986. Disclaimer filed July 16, 1987, by the assignee, *Herrmidifier Co., Inc.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimer and Dedication

4,587,793.—*Eric L. Brennan* and *Kenneth W. Schawel*, Mission Viejo, Calif. PHARMACEUTICAL INFUSION PRODUCTS AND THE PROCESS AND APPARATUS FOR THE MAKING THEREOF. Patent dated May 13, 1986. Disclaimer and dedication filed June 26, 1987, by the assignee, *Home Health Care of America, Inc.*

Hereby disclaims all claims and dedicates to the public the entire term of said patent.

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	Los Angeles Public Library	(213) 612-3273
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 1, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-10-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-26-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,522,401 to 3,526,003, inclusive

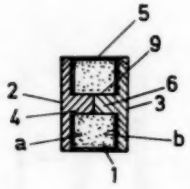
Plant Patents . . . . . Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

SEPTEMBER 8, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 4,021,891 (754th)
MAGNETIC LOCK CLOSURE
Tamao Morita, Tokyo, Japan, assignor to Application Art Laboratories Co., Ltd., Tokyo, Japan
Reexamination Request No. 90/001,055, Jul. 22, 1986.
Reexamination Certificate for Patent No. 4,021,891, issued May 10, 1977, Ser. No. 462,174, Apr. 18, 1974.
Reexamination Certificate B1 4,021,891, issued Aug. 5, 1986.
Int. Cl.[4] A44B *17/00*
U.S. Cl. 24—303



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **5** and **6** were previously cancelled.

Claims **1–3** are determined to be patentable as amended.

Claims **4**, **7** and **8**, dependent on an amended claim, are determined to be patentable.

1. A magnetic lock closure for use with handbags and similar containers comprising:

a magnetic attractor member comprised of:

a single permanent magnet means for supplying magnetic attraction having a first side and a second side of opposite polarities and a hole therethrough between said two sides[;], *and*

a first ferromagnetic plate-shaped body rigidly secured to said first side of said magnet means over said hole for centering the force of the magnetic attraction of said magnet means *through said hole, said magnetic attractor member having an outer lateral peripheral surface; and*

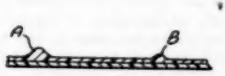
a second ferromagnetic plate-shaped body removably positioned against said second side of said magnet means for contacting and being attracted to said first ferromagnetic plate-shaped body through said hole, said second ferromagnetic plate-shaped body formed as:

a plate [means] adjacent said second side of said magnet means over said hole, and

a rod [means extending from said plate means] *the shape of said hole* rigidly [secured against substantial movement transverse to the plane of said plate means, said rod means adapted to extend into] *attached to said plate extending through* said hole and contacting said first ferromagnetic plate-shaped body, whereby said second ferromagnetic plate-shaped body is magnetically attracted and connected to said first ferromagnetic plate-shaped body *with the magnetic force centered* through said hole; and

a non-ferromagnetic *cover member comprised of a* cover having a central opening adapted to be substantially in register with said hole in said magnet means, said [non-ferromagnetic] cover superimposed at least over substantially the entire surface of said second side of said magnet means without substantially interfering with the magnetic attraction through said central opening *and with an outer peripheral edge spaced from said central opening*, and [to] *a continuous flange portion extending around and depending from the entire outer peripheral edge of said cover and extending toward a plane extending laterally outwardly from the junction of said first side of said magnet means and the outer lateral peripheral surface of said magnet means and said flange portion covering substantially the entire outer lateral peripheral surface of said magnetic attractor member extending from said plane toward said second side of said magnet, said cover member* substantially [protect] *protecting* the covered portion of said magnet means.

B1 4,315,963 (755th)
THERMOPLASTIC FILM WITH INTEGRAL RIBBED PATTERN AND BAG THEREFROM
Carl B. Havens, Newark, Ohio, assignor to The Dow Chemical Co., Midland, Mich.
Reexamination Request No. 90/000,805, Jun. 18, 1985.
Reexamination Certificate for Patent No. 4,315,963, issued Feb. 16, 1982, Ser. No. 170,217, Jul. 18, 1980.
Division of Ser. No. 75,477, Sep. 14, 1979, Pat. No. 4,265,853.
Int. Cl.[4] B65D *85/30*
U.S. Cl. 428—35



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **3** are determined to be patentable as amended.

Claims **2**, **4** and **5**, dependent on an amended claim, are determined to be patentable.

New claims **6–15** are added and determined to be patentable.

1. A thermoplastic film having *a film body with* an integral *mesh* ribbed pattern [thereon] *on one surface thereof*, said ribs *formed from the body of the film itself without a significant increase in film weight and* having a *rounded-peak rib shape with sloping sides but having a* rib sharpness sufficient to permit a large number of ribs per film width to be present in said pattern, the ribs having a thickness at least twice that of the film body between the ribs, the relatively thin film body between the ribs being oriented for toughness, said ribs preventing tear propagation should said film body become ruptured.

B1 4,515,759 (756th)

PROCESS OF REMOVING HYDROGEN SULFIDE FROM GAS MIXTURES

Edward E. Burnes, Arroyo Grande, Calif., and Kishan Bhatia, Katy, Tex., assignors to NL Industries, Inc., New York, N.Y.

Reexamination Request No. 90/001,066, Aug. 14, 1986.
Reexamination Certificate for Patent No. 4,515,759, issued May 7, 1985, Ser. No. 549,274, Nov. 3, 1983.

Int. Cl.[4] B01D *53/34*

U.S. Cl. 423—220

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **3**, **5** and **6** are cancelled.

Claims **1**, **7** and **8** are determined to be patentable as amended.

Claims **4** and **9**, dependent on an amended claim, are determined to be patentable.

1. A process for *selectively* removing hydrogen sulfide from a gas mixture comprising treating [said] *a* gas mixture *comprising natural gas, hydrogen sulfide and carbon dioxide* with an aqueous medium containing [an effective amount of a inorganic water soluble metal] *sodium* nitrite, *said aqueous medium being buffered to* [at] a pH of about 5.5 or greater.

REISSUES

SEPTEMBER 8, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,494
FRICTION SPINNING FRAME

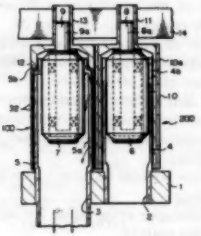
Meiji Asahara, Kariya, and Shigeru Muramatsu, Okazaki, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Original No. 4,606,185, dated Aug. 19, 1986, Ser. No. 769,593, Aug. 26, 1985. Application for reissue Dec. 3, 1986, Ser. No. 937,662

Claims priority, application Japan, Sep. 3, 1984, 59-184772; Sep. 3, 1984, 59-184773

Int. Cl.[4] D01H *1/135, 7/885*

U.S. Cl. 57—401 **5 Claims**



1. A friction spinning frame comprising a pair of twisting rollers disposed substantially in parallel and driven in the same direction to each other at a small gap therebetween to form a yarn forming zone of a valley shaped profile on upper surfaces of said twisting rollers along the gap, at least one of said twisting rollers being a perforated hollow roller comprising an outer shell having a plurality of perforations on the entire outer surface thereof and means for providing a suction force through said perforations on said yarn forming zone, whereby staple fibers are twisted to form a yarn while being sucked and held on said yarn forming zone, characterized in that:

a suction pipe, a part of which is accommodated in the interior of said outer shell and having a suction mouth extending close to an inside wall of said outer shell in the axial direction of said perforated roller is fixedly secured to a machine frame;

a bearing is fixedly accommodated in the interior of said suction pipe; and

a shaft is rotatably supported by said bearing at one end portion thereof and fixedly secured to said outer shell at the other end portion thereof.

Re. 32,495
CHIP RELIEF FOR ROCK BITS

J. Randall Coates, Tonkawa, Okla., assignor to Smith International, Inc., Newport Beach, Calif.

Original No. 4,513,829, dated Apr. 30, 1985, Ser. No. 569,060, Jan. 9, 1984. Continuation-in-part of Ser. No. 337,929, Jan. 8, 1982, abandoned. Application for reissue Feb. 24, 1986, Ser. No. 832,312

Int. Cl.[4] E21B *10/18*

U.S. Cl. 175—339 **5 Claims**

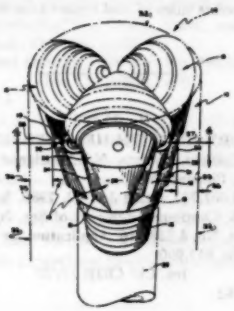
1. An air circulation, air lubricated, roller cone rock bit comprising:

a rock bit body having a first cutting end and a second threaded pin end *having a shoulder*, said body forming a chamber therein, said chamber communicates with said circulation air through an opening formed in said second pin end, said pin end being connected to a drill string,

at least a pair of legs extending from said bit body, each leg forming a shirttail portion and a bearing, each bearing serves to support a roller cutter cone at said first cutting end of said bit, cutting elements adjacent the largest diameter of each roller cone form a gage of a borehole in a formation,

at least one nozzle formed in said bit body in communication with said chamber, said nozzle directs air past each roller cone into said borehole to lift detritus material out of the bottom of the borehole, and

relief means formed by said legs, said relief means serves to pass said detritus material from the bottom of said borehole by the rock bit body and out of said borehole by



providing an annular space between an outer surface of said legs and walls formed by said borehole, said annular space, in a plane perpendicular to an axis of said bit, about adjacent an exit end of said at least one nozzle, is thirty-five percent or more of the *annular* area [formed by] *between the shoulder of the threaded pin end and the walls of* said borehole [through said plane], said annular space progressively enlarges in perpendicular planes between said exit end of said at least one nozzle and a shoulder formed in said bit body, said shoulder forms a thread termination base end for said second threaded pin end of said rock bit.

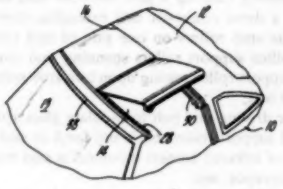
Re. 32,496
REMOVABLE ROOF PANELS FOR VEHICLES

Richard R. Chrysler, Brighton, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Original No. 4,120,529, dated Oct. 17, 1978, Ser. No. 755,665, Dec. 30, 1976. Continuation of Ser. No. 34,671, Apr. 30, 1979, abandoned. Application for reissue Jan. 19, 1981, Ser. No. 226,504

Int. Cl.[4] B60J *7/08*

U.S. Cl. 296—218 **6 Claims**



6. A roof assembly for a vehicle having a [windshield

header] *roof panel* and door and window openings at opposite sides of said vehicle, said vehicle forming a transverse opening in the vehicle roof *panel* defined by a forward edge portion and a rearward portion in said roof *panel* and extending from a window opening at one side of said vehicle to the window opening at the other side of said vehicle, a forward frame connected to said roof panel at said forward edge of said opening, a rearward frame connected to said roof panel rearwardly of said door openings and at said rearward edge of said opening, a center frame member disposed on the center line of said vehicle and fastened to said forward and rearward frame members, said center frame member and forward and rearward frame members forming a pair of oppositely extending spaces at opposite sides of said center member, a pair of panel members detachably connected to cover said pair of spaces, respectively, and a reinforcing plate having a generally H-shaped configuration and being congruous to said center member and to portions of said forward and rearward frame members extending to opposite sides of said center member.

Re. 32,497

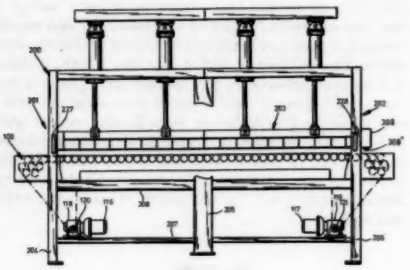
GLASS FURNACE WITH HEAT SENSING MEANS

Douglas M. Canfield, Suffern, N.Y., assignor to Casso Solar Corporation, Pomona, N.Y.

Original No. 4,601,743, dated Jul. 22, 1986, Ser. No. 729,680, May 2, 1985. Continuation-in-part of Ser. No. 531,906, Sep. 18, 1983, Pat. No. 4,528,016. Application for reissue Oct. 10, 1986, Ser. No. 917,990

Int. Cl.[4] C03B *27/00*

U.S. Cl. 65—162 **23 Claims**



1. A furnace for the heat treatment of glass including, annealing, heat-strengthening, tempering and bending of glass which comprises:

a housing defining an elongated furnace chamber having an inlet and an outlet;

a roller conveyor between said inlet and said outlet and including a row of stub rollers disposed along each side of said housing flanking a path between said inlet and said outlet, a drive conveyor belt extending over and under alternate stub rollers on one side of said conveyor, and fused silica support rollers spanning said conveyor with each support roller resting upon two stub rollers overshot by said belt;

means for driving said belt to oscillate glass articles carried by said support rollers back and forth in said housing;

an array of infrared heaters mounted in said housing above said conveyor; and

a computer for displaying parameters for the operation of said heaters in a pattern on a screen corresponding to said array.

Re. 32,498

METHOD OF MANUFACTURING FLUORESCENT SCREENS OF CATHODE RAY TUBES

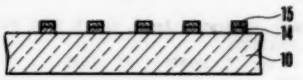
Yoshifumi Tomita, and Hiromitsu Nakai, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,391,885, dated Jul. 5, 1983, Ser. No. 361,269, Mar. 24, 1982. Application for reissue Jul. 5, 1985, Ser. No. 752,359

Claims priority, application Japan, Mar. 27, 1981, 56-43919

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—28 **9 Claims**



1. A method of manufacturing a fluorescent screen of a cathode ray tube comprising the steps of:

forming a film of photosensitive [sticky] substance that exhibits stickiness when exposed to light on an inner surface of a face plate of said tube;

exposing said film to light to render portions thereof sticky;

applying a powdery substance onto said film to cause said powdery substance to adhere to said portions of the film rendered sticky;

removing excess powder to form a film pattern of said powdery substance;

causing the substance responsible for stickiness to ooze out onto said film pattern;

applying another powdery substance onto said film pattern; and

removing an excess of said another powdery substance, thus forming said fluorescent screen.

Re. 32,499

METHOD FOR QUANTITATIVE ANALYSIS FOR LIMONIN

Elmar W. Weiler, Bochum, Fed. Rep. of Germany, and Richard L. Mansell, Tampa, Fla., assignors to University of South Florida, Tampa, Fla., a part interest

Original No. 4,305,923, dated Dec. 15, 1981, Ser. No. 147,732, May 8, 1980. Application for reissue Aug. 16, 1982, Ser. No. 408,497

Int. Cl.[4] G01N *33/53, 33/549*

U.S. Cl. 435—7 **12 Claims**

1. A method for [the] quantitative analysis of limonin *in a sample,* which *method* comprises reacting a known amount of limonin-specific antibodies[,] with [a mixture of a known volume of] *said* sample [containing an unknown amount of limonin] and *with* a known amount of a *readily-detectable, labeled* limonin derivative [labeled with an enzyme or with a radioactive isotope], determining the amount of labeled limonin-derivative which has reacted with said antibodies and [calculating] therefrom the [unknown] amount of limonin in said sample.

PLANT PATENTS

GRANTED SEPTEMBER 8, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,005

CHRYSANTHEMUM PLANT NAMED 'REYELLOW'

Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Association, N.V., Willemstad, Netherlands Antilles

Filed Apr. 12, 1984, Ser. No. 599,979
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinctive variety of Chrysanthemum as described and illustrated in the foregoing specification and accompanying drawings.

6,006

PLUM TREE, "HOWARD SUN"

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Del Rey, Calif.

Filed Nov. 27, 1985, Ser. No. 802,360
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described which is distinguished by producing fruit which matures late in the season, approximately Aug. 25 through 28 at Del Rey, Calif., and which bears a dark blue, almost black-colored fruit which is heart-shaped in appearance and has a firm texture which makes the fruit easy to handle and ship, and furthermore which has excellent cold storage characteristics.

6,007

PEACH TREE, SUMMER SUN

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Del Rey, Calif.

Filed Oct. 16, 1985, Ser. No. 788,132
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described, characterized by its bearing freestone fruit having a yellow flesh and by its general resemblance to the June Lady Peach Tree (unpatented), but from which it is distinguished by its bearing of fruit which mature for harvesting approximately 15 through 20 June, later than that of the June Lady Peach Tree, and having a flesh which is firm and crisp with a skin which is tenacious to flesh.

6,008

PEACH TREE, "SEPTEMBER SUN"

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Del Rey, Calif.

Filed Oct. 11, 1985, Ser. No. 786,829
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described which produces peaches that are full freestone, which have flesh which is crisp and bright Yellow in color, which peaches are ripe for harvesting from August 30 through the first week of September, and which peaches further have skin of medium thickness, which is tenacious to the flesh of the instant variety, and causes fruit of the subject variety to display exceptional handling and shipping characteristics.

6,009

GRAPEVINE, SUGRASIX

John H. Weinberger, 6111 E. Lyell, Fresno, Calif. 93727, and Timothy P. Sheehan, 8701 N. Highway 41, No. 25, Fresno, Calif. 93710

Filed Oct. 15, 1985, Ser. No. 787,459
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine to be known as Sugrasix and the parts thereof, substantially as illustrated and described, characterized principally by its production of grapes which mature in the same season of ripening as the Flame Seedless Grape (unpatented) which it most closely resembles, but from which it is distinguished by producing clusters of seedless grapes which are nearly Red-black in color in contrast to the reddish color characteristic of the Flame Seedless Grapevine variety (unpatented).

PATENTS

GRANTED SEP. 8, 1987

ERRATA

For CLASS	See PATENT NO.
437-044	4,691,433
437-173	4,691,434
437-175	4,691,435
437-033	4,691,436
522-035	4,691,489
206-621	4,691,858
248-429	4,691,946
028-255	4,691,947
439-078	4,691,971
439-077	4,691,972
439-161	4,691,973
439-147	4,691,974
439-266	4,691,975
439-394	4,691,976
439-404	4,691,977
439-620	4,691,978
439-082	4,691,979
439-476	4,691,980
439-816	4,691,981
065-002	4,692,178
437-189	4,692,190
437-120	4,692,194
424-122	4,692,310
428-035	4,692,327
437-082	4,692,348
437-230	4,692,349
568-916	4,692,432
527-300	4,692,478
250-492	4,692,579
324-061	4,692,685
338-198	4,692,805

PATENTS

GRANTED SEPTEMBER 8, 1987

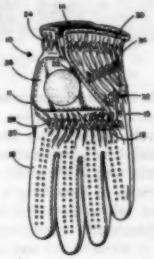
GENERAL AND MECHANICAL

4,691,387
GLOVE APPARATUS
Lionel P. Lopez, Houston, Tex., assignor to Lion's Sports, Inc., Houston, Tex.
Filed Oct. 9, 1984, Ser. No. 658,610
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A **32 Claims**

1. A glove apparatus for use with a baseball bat to provide the secure engagement of the hands with the bat comprising:
(a) one or two gloves for use with the hands,
(b) a palm truss member fixedly secured to the upper portion of the palm of said glove but displaced from, and not associated with, the bending portions of the thumb and the palm,
(c) a thumb truss member fixedly secured between the thumb and the palm of said glove but displaced from, and not associated with, the bending portions of the thumb and the palm,
(d) a finger truss member fixedly secured at the lower portion of one or more fingers of said glove but displaced from, and not associated with, the bending portions of the thumb and the palm,
(e) a pad fixedly secured to said glove for covering the lower, outer portion of the palm thereof, and
(f) a truss-receptive member fixedly secured to the bat for removeably engaging said truss members for providing a no-slip grip between said glove and the bat,
the glove apparatus for protecting the hand and for enhancing the sensitivity of the dexterity of the user.

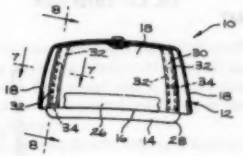
4,691,388
GOLF GLOVE
David D. Boone, Oceanside, Calif., assignor to Lynx Golf, Inc., City of Industry, Calif.
Filed Apr. 18, 1986, Ser. No. 853,691
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A **4 Claims**

1. A sport glove of the type having a palm-side and a knuckle-side joined at a seam and defining a plurality of finger stalls, an access aperture adjacent a wrist-heel that is adapted to be substantially perpendicular to the wearer's arm and a fastenable opening extending from the access aperture toward the finger stalls for placing the glove on the hand and securing the glove thereon; the glove comprising:
first fastening means positioned on one side of said opening;
second fastening means positioned on another side of said opening opposite said first fastening means;
said opening and said first and second fastening means each extending diagonally along said knuckle-side whereby to provide easy access for placing the glove on the hand and removing the glove from the hand;
first elastic means extending between said opening and said seam in a direction substantially perpendicular to said opening, and second elastic means extending along the



wrist-heel of said glove, at least one such first elastic means extending between said opening and said second elastic means and on each side of said seam whereby said first elastic means and said fastening means produce diagonally-directed tension forces through the palm area of said glove when said glove is worn on a wearer's hand.

4,691,389
CAP HAVING STIFFENERS
Eugene F. Meyer, Louisville, Ky., assignor to Town Talk, Inc., Louisville, Ky.
Filed Nov. 3, 1986, Ser. No. 926,507
Int. Cl.[4] A41B *1/02*
U.S. Cl. 2—195 **6 Claims**



1. A cap comprising:
(a) a crown having a brim and including a plurality of crown segments located in side-by-side relationship, with side edges of the crown segments extending upwardly from the crown brim and each crown segment being fastened to its contiguous crown segment along a crown seam adjacent to their contiguous edges;
(b) a visor laterally centered on and attached to the front of the crown brim to extend outwardly therefrom, with the junctures of the peripheral edge of the visor and the crown brim being proximate to two of the crown seams;
(c) a strip of seam tape attached beneath the crown seams on the inside surface of the crown; and
(d) a stay of stiff material located under each of the two crown seams proximate to the junctures of the peripheral edge of the visor and crown brim and disposed between the strip of seam tape and the inside surface of the crown.

4,691,390

SANITARY HEADDRESS

Thomas J. McKeown, Pennsauken, N.J., assignor to Cellucap Manufacturing Company, Philadelphia, Pa.

Filed Dec. 23, 1985, Ser. No. 812,269
Int. Cl.[4] A41D *1/00*
U.S. Cl. 2—200 **7 Claims**

1. A disposable headdress comprising in combination,

(a) a crown portion formed from a web of fabric continuously reversely folded upon itself to form an elongated stacked plurality of pleats extending longitudinally from one end of said web to the other, which pleats are small in width compared to their length and to the length of the web forming said crown portion, the outermost pleats having longitudinally extending marginal edges folded inward and secured to the inner surface of the crown,

(b) stretched elastic cords extending longitudinally the full length of said web and secured substantially continuously thereto within the folded marginal edges of the longitudinally extending outermost pleats, each of said elastic cords in unstretched condition being shorter than the length of web to which it is secured and being stretchable to the full length of the web forming said crown portion, whereby when said elastic cords contract from their stretched to their unstretched condition the crown portion of the headdress is peripherally reduced in size, and

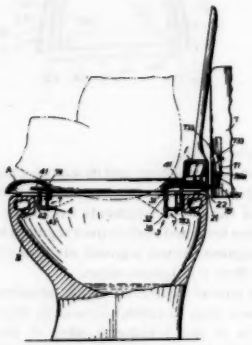
(c) securement means fixedly securing together all of said stacked plurality of pleats and said elastic cords closely adjacent to each end of said folded web which forms said crown portion.

4,691,391

TOILET HAVING WIRE-ADJUSTED WATER-SPRAY NOZZLES

Dai-Ming Kuo, P.O. Box 10160, Taipei, Taiwan

Filed Jun. 9, 1986, Ser. No. 872,146
Int. Cl.[4] E03D *9/08*
U.S. Cl. 4—447 **4 Claims**



1. A toilet having a wire-adjusted water-spray nozzle comprising:

a warm water source;

two valves respectively controlling two branch water conduits directing water from said water source;

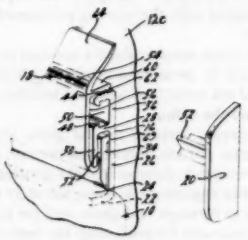
a rear-side nozzle adapted for spraying the human anus, and being fed by one said branch water conduit, a flexible portion formed on said conduit and a water-spray hole with a fixed spraying angle formed in said conduit, a front-side nozzle adapted for spraying the human genitals and being fed by the other branch water conduit, a flexible portion formed on said other conduit and a water-spray hole with a fixed spraying angle formed in said other conduit, a spraying-angle adjuster securing at least one of said nozzles on the toilet and including: a longitudinal casing, a toothed rack reciprocatively moving in said casing, a driving gear engaging and operating the teeth of said rack, said rack having, on the side opposite said teeth, a plurality of recesses, a positioning latch resiliently engaging any one recess of a plurality of recesses for temporarily braking the rack, a flexible hose extending between said rack and either said nozzle and having its one end fixed on a toilet water tank and having the outer end fixed on said toilet seat, an actuating wire reciprocatively jacketed in said hose and having its one end connected with said rack through a driving rod and having the other end connected through a follower rod to a lug of a terminal collar which is fixed to either said nozzle, whereby upon the rotation of said driving gear, said rack will be pushed or retracted to move said nozzle about said flexible portion to adjust the water-spray angle for thoroughly cleaning either human anus or genitals.

4,691,392

JOINT AND TRIM FOR BATHTUBS AND THE LIKE

Thomas H. Whitney, Attica, Mich., assignor to Trayco, Inc., Lapeer, Mich.

Continuation of Ser. No. 615,890, May 31, 1984, abandoned.
This application Feb. 10, 1986, Ser. No. 828,170
Int. Cl.[4] A47K *3/16*
U.S. Cl. 4—595 **3 Claims**



1. A support joint for a tub and the like; said joint characterized by:

a support member having an engaging means for supportingly engaging a peripheral flange of a tub;

said support member having an upwardly extending flange that is constructed to be affixed against a wall;

said support member having connector means;

a trim molding member having interlocking means thereon to interconnect with said connector means;

said trim molding having a portion abutting against said wall and concealing said upwardly extending flange of said support member between said wall and said trim molding;

a support member having a lower horizontally extending ledge for seating a horizontal surface of a bathtub;

a vertical flange upwardly exending from said ledge;

a rib extending from said flange spaced above said ledge;

a downturned rim extending downwardly from a free edge of said rib and being spaced from said vertical flange;

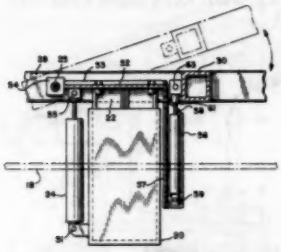
said ledge, vertical flange, rib, and rim forming a channel for receiving an upwardly extending flange of said bathtub.

4,691,393

ANGULAR TILT CONTROL MECHANISM FOR A WHEELED STRETCHER

Jay L. Kuck, St. Marys, Ohio, assignor to Midmark Corporation, Versailles, Ohio

Filed Apr. 25, 1986, Ser. No. 855,976
Int. Cl.[4] A61G 7/00
U.S. Cl. 5—62 **14 Claims**



1. A bed-like stretcher for supporting a patient, comprising:
a frame for supporting a bed surface having a length and a width and defining a head end and a foot end;
a base;
a shaft connecting said frame to said base for pivotal movement of said frame along a horizontal line defined across said width of said frame;
fixing means for fixing said frame in any selected pivotal position within an available range relative to said base;
a release rod connected to said gas spring for selectively releasing said gas springs, thereby permitting pivotal movement of said frame;
a hand-operated actuator mounted to said frame capable of movement in first and second opposite directions to, respectively, first and second positions;
means for biasing said actuator into a normal position intermediate of said first and second positions;
a second rod connecting said actuator to said release rod whereby movement of said actuator in either of said first or second directions releases said gas spring to permit pivotal movement of said frame;
an upward-facing stop surface defined on said base;
a stop bar secured to said frame so as to be adjacent said stop surface when said frame is in a horizontal position;
a spring biasing said bar into contact with said stop surface when said frame is in said horizontal position to prevent downward pivotal movement of said foot end while having no effect on pivotal movement of said head end below horizontal;
a cable connecting said stop bar to said actuator, whereby movement of said actuator in a first direction causes said cable to slacken and movement of said actuator in a second direction causes said actuator to pull said cable to withdraw said bar from contact with said stop surface, thereby permitting pivotal movement of said foot end below horizontal.

4,691,394

COLLAPSIBLE HAMMOCK

Chi Goo Woo, 2119 Potspring Rd., Lutherville, Md. 21093

Filed Dec. 18, 1986, Ser. No. 943,038
Int. Cl.[4] A45F 3/22, 3/24
U.S. Cl. 5—120 **9 Claims**

1. A collapsible hammock comprising:
main laterally disposed support members and cross support members, said main laterally disposed support members being connected to said cross support members to form a supporting base,
a pair of vertically disposed, auxiliary support members extending from each end of said supporting base, one end of each said auxiliary support member being connected to said supporting base by first hinge members, with the other ends thereof being connected together by second hinge members,

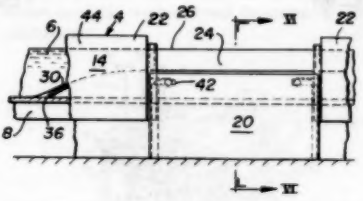
a tensile strength wire member passing through said lateral support members with said hinge members connected therewith, and
a bed member suspended between said vertically disposed auxiliary support members, said bed member being supported at each end by said tensile member attached thereto.

4,691,395

WATERBED FRAMES

John A. Corsetti, 833 SW. Bayshore Blvd., Port St. Lucie, Fla. 33452

Filed Dec. 12, 1986, Ser. No. 941,071
Int. Cl.[4] A47C 19/00, 21/08
U.S. Cl. 5—400 **3 Claims**



1. In a waterbed frame for supporting and confining a bladder-type mattress having a horizontal mattress support member, a head panel, a foot panel and a pair of side panels, the improvement that assists a person reclining in the bed to exit therefrom which comprises:
at least one of said side panels having a section thereof that can be lowered relative to the remainder of said panel to provide an exit area along the side of said frame within which there is no obstruction against egress above the upper level of said mattress and
an arcuate web having a longitudinal side contiguous with said section that slopes upwardly from said support member toward said section thereby to more strictly confine said mattress in the region thereof adjacent said section then over the remainder of said support member.

4,691,396

HOLSTER MOUNT

Gregory C. Hoffman, 716 Crestview Ct., San Marcos, Calif. 92069

Filed Dec. 15, 1986, Ser. No. 941,310
Int. Cl.[4] A47C 21/00; A47F 7/00; A47B 96/06
U.S. Cl. 5—503 **3 Claims**

1. A mount for supporting a handgun and holster adjacent the edge of the user's bed comprising, in combination:
a horizontal support plate having a proximal end adapted to

lie adjacent to the edge of the bed and a distal end adapted to lie inwardly therefrom, constructed and configured to extend from the edge of the bed inwardly toward the center of the bed between the mattress and spring of the bed;

a vertical barrier plate extending vertically from the proximal end of the horizontal support plate, constructed and

configured to lie against the outer vertical edge of the mattress;

a spacer portion extending outwardly from the upper edge of the vertical barrier plate; and

a holster mount portion extending upwardly at an angle of about 45 degrees from the outward edge of the spacer portion, constructed and adapted to receive thereupon a handgun holster.

4,691,397

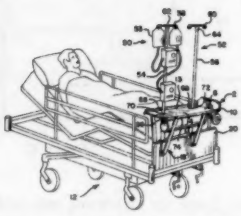
LIFE SUPPORT CARRYING APPARATUS

Ronald G. Netzer, 1037 55th St., Downers Grove, Ill. 60516

Filed Jun. 9, 1986, Ser. No. 871,878

Int. Cl.[4] A47B *23/02;* **A47C** *21/00*

U.S. Cl. 5—507 **7 Claims**



1. A life support carrying means that accommodates life support devices of a bedridden patient substantially within the lateral boundaries of a hospital bed, said hospital bed having a footboard, comprising:

a table-like surface means for supporting said life support devices;

I.V. holder bushing means;

transport means secured to said table-like surface means and including wheel means and axle means;

oxygen bottle support means lying substantially within the boundaries of said table-like surface means;

securing means for complementary mating engagement with the footboard of said hospital bed whereby the weight of the carrying means and the life support devices can be generally distributed along the major plane of said footboard;

I.V. holder means having distal end means for carrying intravenous feeding container means and lower end means for engagement with said I.V. holder bushing means when carrying said intravenous feeding containers; and

means cooperating with said I.V. holder means to form handle means which aid in movement by said transport means.

4,691,398

SHOE MAKING MACHINE

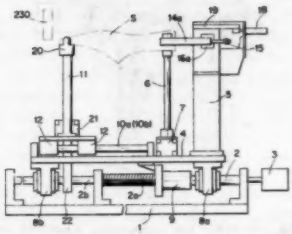
Kouji Kadogawa, Funabashi, and Tsunenori Watanabe, Asaka, both of Japan, assignors to Leader Company Limited, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,654

Claims priority, application Japan, Sep. 22, 1983, 58-174065; Sep. 22, 1983, 58-175238; Sep. 22, 1983, 58-175239; Sep. 22, 1983, 58-175240; Sep. 26, 1983, 58-177670

Int. Cl.[4] A43D *95/16, 95/08;* **C14B** *1/44*

U.S. Cl. 12—77 **5 Claims**



1. A shoe making machine, comprising:

a base;

a slide table movably mounted on said base;

a member fixedly mounted on said slide table for supporting the heel portion of a shoe body to be processed, said supporting member having means for clamping the heel portion of the shoe body;

guide shaft means fixedly mounted on said slide table and disposed in a direction parallel to the direction of movement of said slide table;

a toe portion carrying member having means for accommodating thereon the toe portion of a shoe body to be processed, said toe portion carrying member also having a guide member slidably engaged with said guide shaft means for movement of said toe portion carrying member with respect to said slide table, and thereby with respect to said heel portion supporting member, along said guide shaft means;

means for alternately locking said toe portion carrying member against movement with respect to said slide table or with respect to said base, whereby with said toe portion carrying member being locked against movement with respect to said base, said slide table may be moved on said base and with respect to said toe portion carrying member, thereby changing the distance between said heel portion supporting member and said toe portion carrying member for accommodating shoe bodies of different size, and with said toe portion carrying member being alternately locked against movement with respect to said slide table, said toe portion carrying member and said heel portion supporting member are fixed in relation to one another for supporting a shoe body while said slide table may be moved with respect to said base for processing of the shoe body;

a processing tool head table having a tool for processing the outer marginal portion of the under-surface of a shoe body and having a constant original position to return to slightly away from the toe portion of the shoe body when the shoe body has been set for processing; and,

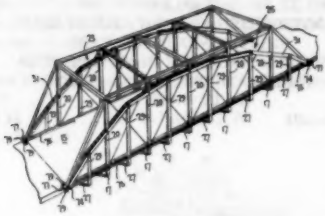
means for simultaneously controlling the longitudinal movement of said slide table carrying a shoe body together with the transverse and vertical movement of said processing tool head table, so that shoe bodies of any size can be promptly processed in accordance with operation commands of a computer having memorized shoe size data.

4,691,399

REHABILITATION OF STEEL TRUSS BRIDGES BY MEANS OF REINFORCING ARCHES

Jai B. Kim, Federal Building, Lewisburg, Pa. 17837, and John M. Yadlosky, 281 Thompsonville Rd., McMurray, Pa. 15317

Filed Nov. 21, 1985, Ser. No. 800,300
Int. Cl.[4] E01D *1/00*
U.S. Cl. 14—2 19 Claims



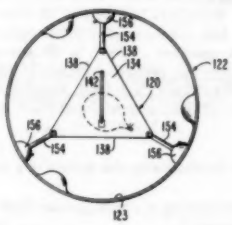
1. The rehabilitation method of increasing the useful life and load-carrying capacity of an existing steel truss bridge which itself is capable of carrying and has carried vehicle loads, the steel truss including top and bottom members, said method comprising the steps of superimposing a pair of relatively lightweight support arches and post-tensioning members for the respective arches on the existing truss in respective vertical planes on opposite transverse sides of the bridge such that the support arches are themselves laterally supported by the existing truss, the arches extending at least partly between the top and bottom members of the truss, and using the post-tensioning members for post-tensioning at least the support arches after superimposing same on the truss.

4,691,400

ARTICLE BUFFING APPARATUS AND METHOD

Howard M. Arneson, 6 Locksley La., San Rafael, Calif. 94901

Continuation-in-part of Ser. No. 502,433, Jun. 9, 1983, Pat. No. 4,566,144. This application Oct. 23, 1985, Ser. No. 790,300
Int. Cl.[4] A47L *23/00*
U.S. Cl. 15—3 37 Claims



1. Buffing apparatus comprising:

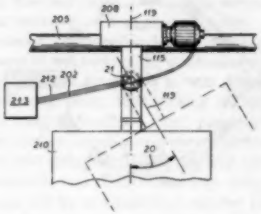
a container; a flexible bag of buffing material for placement into the container, said bag adapted for receiving an article to be buffed, said container adapted to be placed in a shiftable bin and moved about relative to a predetermined reference as the bin is shifted, there being a buffing element for placement in the bag, said element having a buffing material thereon frictionally engageable with the article in the bag, said container being of a size to permit the bag, the article and the element to move relative to container as the container is moved relative to said reference.

4,691,401

WASHING APPARATUS FOR A MOTOR VEHICLE

Roy Machin, Im Kälblesbiegel 16, 741 Reutlingen 3, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,273
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3508945
Int. Cl.[4] B60S *3/06*
U.S. Cl. 15—53 A 13 Claims



1. In a washing apparatus for an automotive vehicle comprising at least one washing brush with a substantially vertically oriented rotation axis, a brush mechanism for guiding and transporting said washing brush on a course over and around said vehicle to be washed, and a control mechanism for said washing apparatus, the improvement which comprises:

a sensing element connected to said control mechanism which responds to an incipient potentially detrimental catching of said washing brush during rotation thereof as it travels over said course; and

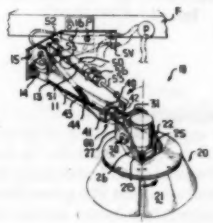
means connected to said element for reversing the rotation direction of said washing brush by acting on said control mechanism.

4,691,402

ADJUSTABLE SINGLE LOCK GUTTER BROOM MECHANISM

Kenneth R. Veselka, Rte. 1, Box 107V, Axtell, Tex. 76624

Filed Mar. 25, 1986, Ser. No. 843,633
Int. Cl.[4] F01H *1/04*
U.S. Cl. 15—87 38 Claims



1. A gutter broom mechanism comprising an arm, a gutter broom, means for connecting said gutter broom to said arm for pivoting movement about two axes disposed generally normal to each other, means for locking said connecting means in any one of a plurality of different positions of said gutter broom relative to said arm, and said locking means including single locking means for simultaneously locking said connecting means to prevent pivoting movement about said two axes.

4,691,403

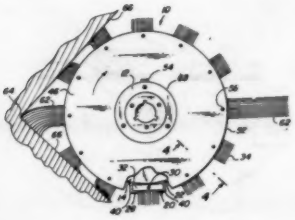
COMBINATION BASE BOARD/CORNER & FLOOR BRUSH HOLDER

Stephen Scharf, 54 Farmington La., Melville, N.Y. 11747

Continuation-in-part of Ser. No. 767,828, Aug. 21, 1985, abandoned. This application Apr. 3, 1986, Ser. No. 847,667

Int. Cl.[4] A46B *13/02*

U.S. Cl. 15—114 **7 Claims**



1. A combination base board/corner and floor brush holder for a floor polishing machine which comprises;

(a) a hub having a circular base flange wherein said hub is removably attachable to said floor polishing machine for rotating thereby;

(b) a circular pad for removable attachment to bottom of said circular base flange for use on a floor;

(c) means for removably attaching said circular pad to said bottom of said circular base flange in which said circular pad can be replaced when needed;

(d) a plurality of brushes for removable attachment around perimeter of said circular base flange for use on a base board of a wall;

(e) means for removably attaching said brushes to said perimeter of said circular base flange in which each said brush can be replaced when required; and

(f) means for polishing base boards to a corner apex between two walls which are at right angles to each other, which include at least a single brush with longer and softer bristles than said plurality of brushes where by said longer and softer bristles whip into the corner between said two walls and thereby polish said base board to said apex.

4,691,404

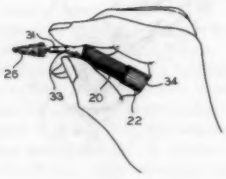
TOOTHBRUSH

Emanuel B. Tarrson; Dane Maric, both of Chicago, and Thomas P. Kelly, Palatine, all of Ill., assignors to John O. Butler Company, Chicago, Ill.

Continuation-in-part of Ser. No. 703,745, Feb. 21, 1985, abandoned. This application Apr. 21, 1986, Ser. No. 856,431

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—167 R **21 Claims**



13. A toothbrush having a handle made from a mixture of approximately 80% thermoplastic elastomer and 20% general purpose polypropylene, a twisted wire brush having a stem embedded in said handle and projecting from the handle in axial alignment therewith, the brush having dimensions which can be held within a loosely clasped fist, with one end of the brush held captured between a thumb and an index finger and the other end of the brush captured along the length of the index finger, the part held by the thumb and index finger being reduced in cross-section with respect to the remainder of the handle and having a flexibility and a resiliency such that by mahipulating the thumb and index finger, the angle at which the brush projects from the hand may be changed at will.

4,691,405

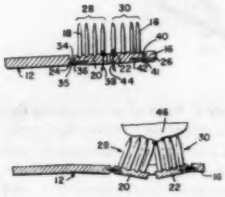
TOOTHBRUSH HAVING ADJUSTABLE BRISTLE-MOUNTED TABS

Joseph C. Reed, 114 5th St., Seal Beach, Calif. 90740

Filed Jul. 29, 1985, Ser. No. 759,896

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—201 **11 Claims**



1. A toothbrush comprising the combination of a handle portion, a base portion at an end of the handle portion and having a central aperture therein, at least one tab portion disposed within the central aperture of and adjacent and moveable relative to the base portion, a metal plate embedded in the base portion so as to surround at least a substantial portion of the central aperture and extending into the tab portion, a first plurality of bristles mounted in the base portion and a second plurality bristles mounted in the tab portion.

4,691,406

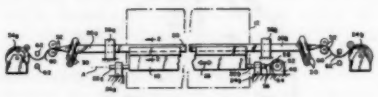
DOCTORING APPARATUS

Ronald F. Goodnow, Leicester, and Robert A. Reid, Charlton City, both of Mass., assignors to Thermo Electron-Web Systems, Inc., Auburn, Mass.

Filed Sep. 2, 1986, Ser. No. 902,515

Int. Cl.[4] B08B *1/02*

U.S. Cl. 15—256.53 **10 Claims**



1. Apparatus for doctoring the surface of a rotating cylinder, comprising:

a doctor blade having a length greater than the axial length of the cylinder;

blade holding means for applying an intermediate portion of said doctor blade to the surface of the cylinder, said blade being longitudinally movable through said holding means and having continuing portions extending beyond the ends of said blade holding means;

clamping means for acting on at least one of the continuing portions of said blade, said clamping means being adjustable between a closed setting preventing relative movement between said blade and said clamping means, and an open setting permitting said relative movement; and

a drive for reciprocating one of said means in one direction when said clamping means is closed and in the opposite direction when said clamping means is open, thereby

causing said blade to move incrementally in one direction across the surface of the cylinder.

4,691,407

LIQUID RECOVERY UNIT

Alex Sloan, 284 Gt Western Rd., Aberdeen, United Kingdom (AB1 6PJ), and Lyall Rennie, Dunisla, 5 Lochburn Dr., Kintore; Aberdeenshire, United Kingdom (AB5 0UW)

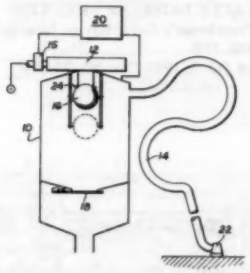
PCT No. PCT/GB84/00402, § 371 Date Jul. 22, 1985, § 102(e) Date Jul. 22, 1985, PCT Pub. No. WO85/02356, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 23, 1984, Ser. No. 762,067

Claims priority, application United Kingdom, Nov. 23, 1983, 8331234

Int. Cl.[4] A47L *5/38*

U.S. Cl. 15—339 **7 Claims**



1. Apparatus for recovering liquids, comprising a vessel for containing liquid, a vacuum pump for creating a vacuum in said vessel, conduit means for sucking liquid into said vessel, a first valve means actuated by liquid in said vessel on reaching a predetermined level to cause a loss of vacuum in said vessel, means adapted to discharge liquid from the vessel when vacuum is lost, and pneumatic logic means responsive to said loss of vacuum to disable said vacuum pump for a predetermined time period.

4,691,408

FURNITURE HINGE HAVING A RESILIENT CATCH AND SPACER MECHANISM

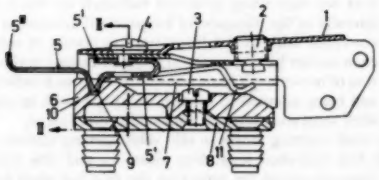
Erich Röck, Höchst; Helmut Rupprechter, and Klaus Brüstle, both of Lauterach, all of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Oct. 3, 1985, Ser. No. 783,639

Claims priority, application Austria, Oct. 19, 1984, 3339/84

Int. Cl.[4] E05D *7/06*

U.S. Cl. 16—241 **5 Claims**



1. A furniture hinge comprising:

a mounting plate to be mounted on a wall of an article of furniture, said mounting plate having therein a surface recess;

a hinge arm having a U-shaped profile and to be connected to a door of the article of furniture;

an intermediate member for mounting said hinge arm on said mounting plate, said intermediate member being connected to said hinge arm by means of an adjustment screw for adjusting the spacing between said hinge arm and said mounting plate;

said mounting plate and said intermediate member having interengaging lateral recesses and projections extending in a longitudinal direction, such that said intermediate member and thus said hinge arm may be moved in said direction and mounted on said mounting arm;

said intermediate member including means for limiting the movement of and locking the position of said intermediate member and said hinge arm in said direction relative to said mounting plate, said locking means comprising a resilient member having a catch projection which snaps into said surface recess in said mounting plate upon movement of said intermediate member and said hinge arm in said direction, said resilient member being connected to said hinge arm by an adjustment member for adjusting the position of said hinge arm relative to said mounting plate and said resilient member in said direction; and

said resilient member including an integral handle forming means for enabling manual resilient deformation of said resilient member to release said catch projection from said recess, whereafter said intermediate member and said hinge arm can be withdrawn from said mounting plate.

4,691,409

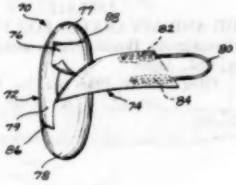
HINGE MASK

Gary D. Torgerson, and Joyce E. Ferm, both of Seattle, Wash., assignors to Ferm & Torgerson Partnership, Seattle, Wash.

Continuation-in-part of Ser. No. 859,409, May 5, 1986, abandoned. This application Dec. 15, 1986, Ser. No. 941,790

Int. Cl.[4] E05D *11/00*

U.S. Cl. 16—250 **15 Claims**



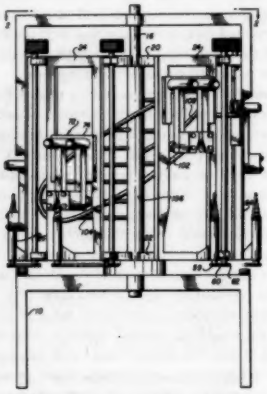
1. A hinge mask for masking a hinge that includes a hinge barrel and a pair of hinge plates, the hinge mask comprising a body composed of an elastic sheet material and fastening means, the body comprising first and second body portions, the first body portion having first and second concave sections and an intermediate section extending between the concave sections with the concave sections opening towards the intermediate section and the intermediate section having a longitudinal opening extending between the concave sections, the second body portion comprising an elongated member having first and second ends, the first end of the second body portion being secured to the second concave section, the fastening means being connected to the second body portion near the second end thereof and including means for securing the second end to one end of the hinge.

4,691,410

GIZZARD HARVESTER

Dale M. Risser, Salisbury, Md., and Michael E. Lease, Delmar, Del., assignors to Perdue Incorporated, Salisbury, Md.

Filed Mar. 17, 1986, Ser. No. 839,950
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 **12 Claims**



1. A device for removing foreign material and lining from a gizzard, comprising

means for holding the gizzard against rotation,

a spindle head having a tip facing the holding means,

means for producing relative rotation between the spindle head and the gizzard holding means,

means for producing relative linear movement between the spindle head and the gizzard holding means so that said gizzard is forced to engage progressively larger diameters of said spindle head,

said spindle head having a surface adapted to engage the gizzard lining as said relative rotation occurs, thereby to separate the lining from the gizzard, and

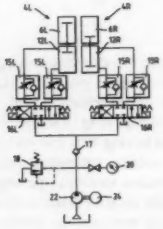
means for washing foreign material from said gizzard.

4,691,411

METHOD AND APPARATUS FOR FEEDING MEAT

Tsuyoshi Higashimoto, Ikoma, Japan, assignor to Higashimoto Kikai Co., Ltd., Japan

Filed Dec. 16, 1985, Ser. No. 809,136
Int. Cl.[4] A22C *11/08*
U.S. Cl. 17—49 **12 Claims**



1. A method of continuously feeding meat at constant pressure using a plurality of reciprocating pumps, comprising the steps of:

(a) providing at least two reciprocating pumps, each pump having a piston movable in a feed cylinder, each feed cylinder having meat inlet ports and outlet ports, said outlet ports being connected to a common discharge line,

(b) operating the pumps for sucking meat during respective suction strokes alternately through the inlet ports and into the feed cylinders, and for delivering meat during respective delivery strokes alternately through the outlet ports from the feed cylinders,

(c) pre-compressing the meat within the feed cylinder of one pump by slightly moving the piston of said one pump after the completion of the suction stroke of said one pump, and

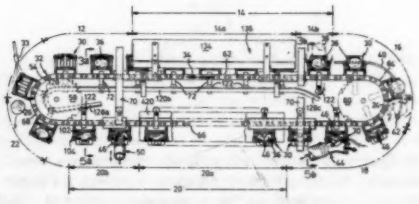
(d) starting the delivery stroke of said one pump prior to the completion of the delivery stroke of another pump, and actually pumping the meat from the feed cylinder of said one pump so as to feed meat under pressure continuously into the discharge line and to maintain the pressure on the meat at a constant level within the discharge line.

4,691,412

BIVALVE MOLLUSK SHUCKER

Oswald Brown, Frenchman's Cove, Bay of Islands, Newfoundland, Canada A0L 1E0

Filed Jul. 8, 1985, Ser. No. 752,845
Int. Cl.[4] A22C *29/04*
U.S. Cl. 17—74 **16 Claims**



1. A mollusk shucker for use in shucking bivalve mollusks which have two half-shell portions connected at a hinge end by an edible muscle, and each half-shell having a distal end remote from the hinge end, comprising:

(a) a conveyor mounted for longitudinal movement in an endless path extending through a loading station, a shell opening station, a first half-shell removal station, an eviscerating station, an edible muscle removal station and a second half-shell discharge station,

(b) a plurality of mollusk carriers mounted on said conveyor, said mollusk carriers have an inner side wall and a seat at one end of the inner side wall, said mollusk carriers being arranged to locate the seat at the lower end of the inner side wall and to position the inner side wall so that it extends in a direction parallel to the direction of longitudinal movement of the conveyor and is angularly inclined with respect to the vertical during movement of the conveyor through said loading and shell opening stations such that the inner side wall forms an inclined underlying support for supporting a second half-shell so that it opens laterally of the direction of longitudinal movement of the conveyor with its the hinge portion resting in said seat, each carrier having a central plane extending in the direction of movement of said conveyor along said endless path and being adapted to support a mollusk with its plane of shell separation aligned with said central plane,

(c) shell opening means in said shell opening station,

(d) first half-shell separation means in said first half-shell removal station for removing the first half-shell from its carrier,

(e) eviscerating means in said eviscerating station for removing the inedible viscera from the second half-shell without removing the edible muscle,

(f) edible muscle removal means in said edible muscle re-

moval station adapted to remove the edible muscle from said sacond half-shell and,

(g) release means in said second half-shell discharge station for discharging the second half-shell from its carrier.

4,691,413

SLIVER COILER

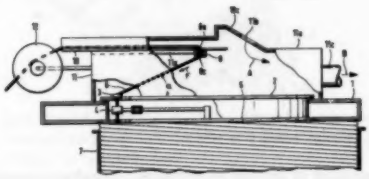
Jürgen Klüttermann, and Hermann Trützschler, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed May 12, 1986, Ser. No. 862,241

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517058

Int. Cl.[4] B65H *54/80*

U.S. Cl. 19—159 R **13 Claims**



1. In a sliver coiler including a rotary head assembly having a radius and being arranged for rotation in a generally horizontal plane; a trumpet mounted eccentrically in said rotary head assembly; and a sliver supporting means situated at a vertical distance above said rotary head assembly and arranged for guiding the sliver to said trumpet orbiting during rotation of said rotary head assembly; the improvement comprising a hood enclosing a volume above the rotary head assembly; said hood having a ceiling wall provided with an air inlet opening; said sliver supporting means being stationarily affixed to and including a sliver inlet opening through which the sliver enters into said volume from an exterior or said hood; said air inlet opening and said sliver inlet opening being spaced from one another; further comprising suction means including an air outlet opening provided in said hood spaced from said sliver supporting means and from said inlet opening for removing air and dust immediately from said sliver supporting means in an upper part of said hood.

4,691,414

SLIVER COILER DRIVE

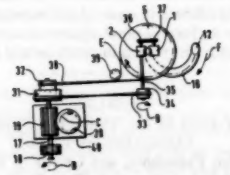
Jürgen Klüttermann, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jun. 26, 1986, Ser. No. 879,064

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1985, 3524601

Int. Cl.[4] B65H *54/80*

U.S. Cl. 19—159 R **7 Claims**



1. In a sliver coiler including a coiler head supported for rotation about a generally vertical axis; a sliver depositing means carried by said coiler head eccentrically relative to said axis and arranged for receiving sliver from above and discharging sliver downwardly during rotation of the coiler head; a pair of cooperating pressure rollers supported for rotation stationarily upstream of the sliver depositing means as viewed in a running direction of the sliver passing between said pressure rollers; a rotatably held platform situation underneath said coiler head at a vertical distance therefrom for supporting a coiler can into which sliver running downwardly from said coiler head is deposited; and drive means including a rotatably supported power-driven shaft and first and second drive elements for said coiler head and said pressure rollers, respectively; said first and second drive elements being operatively connected with said power-driven shaft; the improvement wherein said first drive element is mounted on said power-driven shaft; the improvement further comprising a transmission element connecting said first drive element with said coiler head; a third drive element mounted on said power-driven shaft; a first additional shaft operatively connecting said third drive element with said rotary platform; a second additional shaft; said third drive element including a worm gear mounted on said power-driven shaft and a pinion mounted on said second additional shaft and meshing with said worm gear; a transmission ratio-changing gearing mounted on said first and second additional shafts and meshing with said pinion for drivingly connecting said pinion to said first additional shaft; first wheel means mounted on said first additional shaft at a distance from said transmission ratio-changing gearing; second wheel means coaxially and rigidly connected with said platform; and an endless belt trained about said first and second wheel means.

4,691,415

ROLLER OF DRAFT APPARATUS

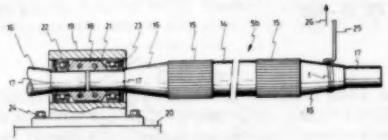
Shoji Sakai, Nagaokakyo, and Koshi Noda, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 4, 1986, Ser. No. 893,007

Claims priority, application Japan, Aug. 12, 1985, 60-123837

Int. Cl.[4] D01H *5/74*

U.S. Cl. 19—262 **2 Claims**



1. A draft apparatus for drafting a fiber bundle while holding the fiber bundle under pressure by plural pairs of rotating rollers which comprises:

(a) a plurality of draft rollers each having a support end and spaced, coaxial, cylindrical serrated draft sections separated by a cylindrical portion of slightly smaller uniform diameter in comparison to the diameter of the serrated sections, and tapered sections connecting the serrated sections and said support ends in a gradually reducing tapered angle, and

(b) a cutter element positionable adjacent the smaller end of said tapered sections movable in a direction transverse to the axis of rotation of said rollers to cut and release the loops of fibers moving from said draft sections and collecting on said tapered section.

4,691,416

HOOK DEVICE FOR ORNAMENTAL BUTTON ON SEAT COVER

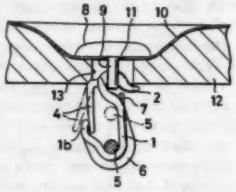
Hiromichi Nakayama, and Moritoshi Fukuda, both of Yokohama, Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Sep. 26, 1986, Ser. No. 912,773

Claims priority, application Japan, Sep. 30, 1985, 60-148023[U]

Int. Cl.[4] A44B *1/18*

U.S. Cl. 24—90 B **2 Claims**



1. A an integral hook device of molded plastic material for hooking an ornamental button on a seat cover, comprising:

a C-shaped main hook to be hooked on a spring rod disposed on the inner side o a cushioning material under the seat cover, said C-shaped main hook being substantially wider than it is thick and having an inner surface that is laterally linear, said C-shaped main hook having an elongated reinforcing rib on the outside thereof and substantially on a central plane thereof, said C-shaped main hook having an end and a free extremity;

a C-shaped auxillarly hook extending integrally from said end of said main hook in the opposite direction to said main hook to be hooked on a lock piece of said ornamental button;

and a closing piece extending from said end of said main hook toward said free extremity end thereof for closing an opening of said main hook.

4,691,417

DEVICE FOR THE MANUFACTURE OF NON-WOVEN FABRICS WITH IMPRESSED OR EMBOSSED DESIGNS

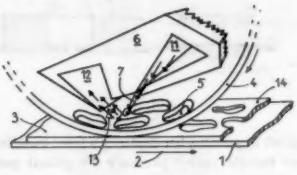
Andre Vuillaume, 63 Clos de Franquieres, Bivierd (Isere), France

Filed Nov. 18, 1983, Ser. No. 553,360

Claims priority, application France, Nov. 19, 1982, 82 19716

Int. Cl.[4] D04H *18/00*

U.S. Cl. 28—105 **4 Claims**



1. A device for imprinting impressed or relief designs on a sheet of non-woven fibers, comprising:

perforated means for patterning said sheet of non-woven fibers;

supporting fabric means for supporting said sheet of non-woven fibers against said perforated patterning means;

hydraulic injector means for discharging a curtain of liquid at an oblique angle against said perforated patterning means; and

suction chamber means for collecting liquid splashed from said perforated patterning means at an oblique angle, said hydraulic injector means and said suction chamber means being located on the same side of said perforated patterning means.

4,691,418

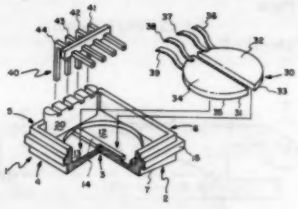
ULTRASONIC TRANSDUCER METHOD

Frank W. Ingle, and John P. Claude, both of Palo Alto, Calif., assignors to Medasonics Inc., Mountain View, Calif.

Filed Aug. 11, 1986, Ser. No. 895,273

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—25.35 **13 Claims**



1. A method of making an ultrasonic transducer assembly comprising the steps of:

injection-molding a body member having an end wall and a plurality of side walls, said end wall having a pair of exterior planar surfaces, each of said exterior planar surfaces extending from a centerline of said end wall outwardly to a side edge of said end wall at a predetermined angle relative to each other, an interior surface, and a pair of recesses located in said interior surface which are separated from each other by a central rib which extends along said centerline of said end wall, each of said recesses having a planar surface which is parallel to one of said exterior planar surfaces of said end wall, said side walls having a radially extending exterior rib which is located between the top and bottom surfaces thereof and which extends about the periphery thereof, one of said end walls which is located at one end of said central rib including a multiple pin receiving post which is integrally formed therewith and which extends perpendicularly from said interior surface of said end wall, said post having a plurality of equally spaced, tapered, pin receiving holes;

providing a pair of piezoelectric ceramic planar members, each of said members having a pair of conductive electrodes covering and affixed to opposite surfaces thereof, respectively;

providing a plurality of metal ribbons;

attaching one of said ribbons to each of said electrodes, each of said ribbons having a length sufficient for it to be inserted well into a corresponding one of said plurality of tapered holes in said multiple pin receiving post;

attaching one of said pair of ceramic planar members to said planar surface in each of said recesses; and

inserting an electrically conductive pin and the free end of one of said ribbons in each of said tapered holes in such a manner as to form a good electrical connection between said pin and said ribbon inserted in said hole.

4,691,419

ROBOT END EFFECTOR FOR PROCESSING COMPONENT LEADS

Brian G. Keeler, Plainsboro, and George J. Whitley, Philadelphia, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 12, 1985, Ser. No. 797,132

Int. Cl.[4] B23P *19/00*

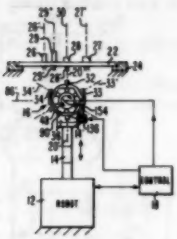
U.S. Cl. 29—39 **15 Claims**

1. An apparatus for operation by a robot to process a component lead, extending from a substrate at a reference location

and orientation, with a lead processing device having a first element and a second element at least one of which movably cooperates with the other to process said lead, said apparatus comprising:

a support adapted to be attached to said robot;

an annular member secured to the support for rotation about an axis, said member including a plurality of means annularly spaced about the axis, each for releasably securing a lead processing device thereto at a given annular position relative to said axis; and



means secured to the support and coupled to the member for selective displacement in opposite linear directions parallel to said axis for simultaneously operating a releasably secured lead processing device at any of said spaced means.

4,691,420

STONE PRESSURE ROLL FOR A WEB OF FIBERS

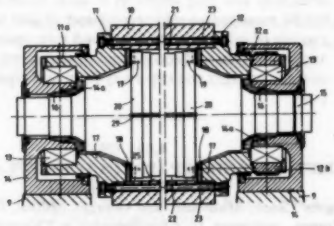
Christian Schiel, Heidenheim, and Herbert Kotitschke, Lenningen, both of Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,969

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528588

Int. Cl.⁴ B21B *13/02, 31/08*

U.S. Cl. 29—116 R **21 Claims**



1. A roll for exerting pressure on a web of fibers or the like comprising:

a rotatable hollow roll shell comprised of stone material, said hollow roll shell having an inner surface on the inside thereof and a roll shell outer surface on the exterior of said roll shell;

a stationary beam disposed in said hollow roll shell, said beam having two ends;

a beam support means disposed at each end of said stationary beam, said beam being sized such that an annular space is defined between said stationary beam and said inner surface;

sealing means supported on said beam and extending into contact with said inner surface of said roll shell and being shaped for defining a portion of said annular space, said inner surface of said roll shell presenting a smooth sealing surface for contacting said sealing means; and

means for pressurizing said portion of said annular space.

4,691,421

PRESS ROLL WITH ADJUSTABLE SAG

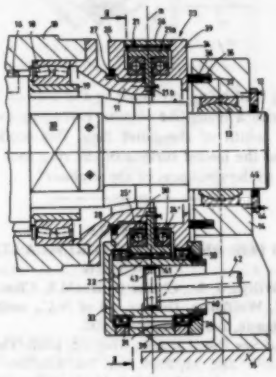
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH' , Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,724

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623028

Int. Cl.⁴ B21B *13/02, 31/32*

U.S. Cl. 29—116 AD **20 Claims**



1. A press roll with adjustable sag comprising:

an elongated rotatable hollow roll shell, a relatively stationary yoke extending axially through said roll shell, and a hydraulic support device for transmitting a pressing force from the yoke to the roll shell in a press plane;

an outer gear rim secured to one end of the roll shell in a position concentric therewith, and a drive pinion having gear teeth in driving mesh with gear teeth on said outer gear rim;

a gear housing which surrounds the pinion and the outer gear rim, and support bearings within said housing rotatably mounting the housing on the roll shell;

a support disk interposed between the outer gear rim and the roll shell, and being positioned substantially centrally relative to the length of the teeth on the outer gear rim;

said support bearings being disposed radially within the outer gear rim and on both sides of the support disk.

4,691,422

METHOD AND APPARATUS FOR MAKING BALL AND SOCKET JOINTS INCORPORATING A SLIP LINER

Leopold Tilgner, Püttlingen; Jurgen Scholer, Losheim-Wahlen; Sieghart Sautter, Saarlous, and Jürgen Vogel, Künzelsau, all of Fed. Rep. of Germany, assignors to SKF Gleitlager GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 10, 1986, Ser. No. 884,083

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524761

Int. Cl.⁴ B21D *53/10;* **B23P** *19/00*

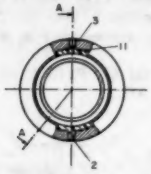
U.S. Cl. 29—149.5 B **4 Claims**

1. A method for making ball and socket joints with a slip liner of a friction reducing material consisting of the steps of:

inserting and centering a ring tool in the bore of the outer ring, filling the space between the outer ring and the ring tool with a friction reducing material;

separating the ends of the outer ring and simultaneously breaking the slip liner at a predetermined point, removing the ring tool, and inserting the inner ring of the ball and socket joint.

3. An apparatus for making ball and socket joints comprising inner and outer rings and a liner between the rings, the apparatus comprising a ring tool wherein the diameter of the ball is larger than that of the inner ring by an amount equal to the play in the bearing:



said ring tool being provided in the area of the separating line with a blade-like section extending over nearly the entire width of the outer ring, this section projecting beyond the lateral surface of the ring tool by an amount equal to the thickness of the slipliner.

4,691,423

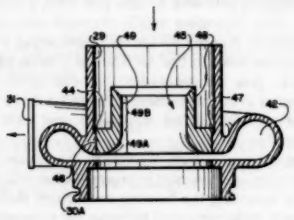
METHOD FOR REMANUFACTURING A COMPRESSOR HOUSING

Dewey L. Willyard, Jr., Charlotte; David E. Cline, Concord, and David E. Wulfhorst, Denver, all of N.C., assignors to Cummins Atlantic, Inc., Charlotte, N.C.

Division of Ser. No. 736,664, May 22, 1985. This application Jan. 31, 1986, Ser. No. 824,736

Int. Cl.[4] B23P *15/00, 7/00*

U.S. Cl. 29—156.4 R **2 Claims**



1. A method of remanufacturing an air compressor housing having an integrally-formed inlet throat comprising a radially in wardly spaced annular collar portion nested within a radially outwardly spaced air inlet portion of the compressor housing, comprising the steps of:

(a) machining away the integrally-formed inlet throat from the interior sidewall of the air inlet portion of the compressor air compressor housing to leave a radially inwardly disposed annular seat on the walls of the housing defining the bore;

(b) forming a separate inlet throat insert comprising a radially inwardly spaced annular collar portion integrally connected with a case portion and adapted to be telescopically positioned within the bore of said compressor housing, said insert having seating means formed around the periphery of the base portion for mating cooperation with the seat on the interior sidewall of the housing; and

(c) telescopically positioning said inlet throat insert in the bore of the compressor housing with the annular collar portion nested with and spaced radially outwardly from, the air inlet portion of the compressor housing and securing the inlet throat insert to the compressor housing in mating cooperation with the seat on the interior sidewall of the housing.

4,691,424

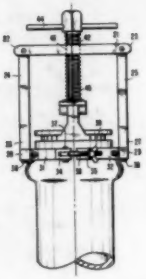
PIPE CAP EXTRACTOR APPARATUS

E. Michael Schmidt, Carmel, and P. Michael Price, Greencastle, both of Ind., assignors to Harte Industries, Inc., Carmel, Ind.

Filed Jan. 16, 1986, Ser. No. 819,284

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—261 **11 Claims**



1. An extractor for removing an end cap mounted to a pipe wherein said pipe includes an outwardly extending ridge, comprising:

a frame having a threaded hole;

a screw with a first end and an opposite second end threadedly mounted in said hole and extendable lengthwise with said pipe;

a hook shaped end cap engager mounted to said first end of said screw hookingly engagable with said cap and including a pair of arms pivotally mounted thereto;

a pipe engager mounter to said frame and extendable against said pipe and including two depending legs pivotably mounted to said frame and a ring comprising plural ring segments mounted to said legs, said ring surrounding said pipe and being engagable with said ridge, said ring having mutually facing surfaces positionable around said pipe with said surfaces being a fixed distance apart; means connected to said ring segments for quickly attaching and detaching said ring segments to each other; and,

a handle mounted to said second end of s .id screw for the turning of said screw to force said ring against said ridge and away from said second end of said screw and to force said cap engager and cap away from said pipe engager and pipe.

4,691,425

METHOD AND APPARATUS FOR REPLACING A FILTER IN A VESSEL

Jacques Lance, Mulhouse, and Georges Müller, Dijon, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 16, 1983, Ser. No. 562,416

Claims priority, application France, Dec. 17, 1982, 82 21204

Int. Cl.[4] B23P *19/04;* **B01D** *46/04*

U.S. Cl. 29—402.08 **12 Claims**

1. A method for replacing a filter placed in a vessel to filter a fluid circulating in said vessel, said vessel comprising:

a hollow upstream part;

a hollow downstream part separated from said upstream part by a space, said filter being positioned in said space and having a first face and an opposed second face;

a hollow member movable between a closed position, in which it closes said space and surrounds said filter when fluid is circulating through all of said hollow members, and an open position allowing access to the filter from all sides thereof; and

means for sealingly fixing said hollow member to said upstream part and said downstream part to contain said

circulating fluid within said hollow members, said method comprising the following steps:

(a) unfixing said hollow member from said upstream part and said downstream part,

(b) moving said hollow member from its closed position to its open position,

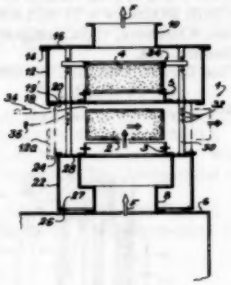
(c) removing said filter,

(d) putting a new filter in place in said vessel,

(e) moving said hollow member back from its open position to its closed position, and

(f) fixing said hollow member to said upstream part and said downstream part.

5. An apparatus for replacing a filter placed in a vessel to filter a fluid circulating in said vessel, said vessel comprising:



a hollow upstream part, and

a hollow downstream part separated from said upstream part by a space, said filter being positioned in said space, and having a first face and an opposed second face,

said apparatus comprising:

a hollow member movable between a closed position, in which it closes said space and surrounds said filter, when fluid is circulating through all of said hollow members and an open position allowing access to the filter from all sides thereof; and

means for sealingly fixing said hollow member to said upstream part and said downstream part to contain said circulating fluid within said hollow members.

4,691,426

REPAIR OF STRIP CONDUCTOR ON ELECTRICAL CIRCUIT BOARD

Joseph A. Roucek, Apalachin, and James R. Tessier, Owego, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 5, 1986, Ser. No. 836,411

Int. Cl.⁴ B23K *1/00*

U.S. Cl. 29—402.18 **10 Claims**

1. A method for correcting a defect in a plated electrical conductor on a circuit board comprising:

positioning a cutter near the conductor;

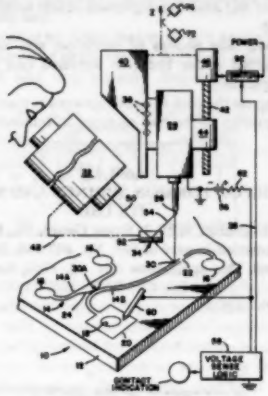
applying a voltage between the cutter and a portion of the conductor;

selecting a contact point on said conductor portion to be contacted by the cutter;

guiding the cutter towards said contact point under optical guidance;

noting a change in said voltage upon a contacting of said cutter with said conductor at said contact point;

advancing said cutter a predetermined distance beyond said contact point after the occurrence of said change in voltage to bring said cutter to said predetermined distance beyond said contact point; and correcting said defect, said



correcting including a translating of said cutter relative to said conductor along a surface parallel to said conductor.

4,691,427

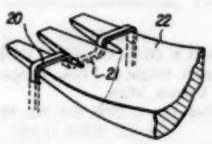
TAPE FASTENING SYSTEM

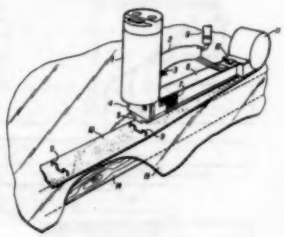
Delmar J. Hill, Medford, N.J., assignor to Vanguard-Hill, Inc., Wilmington, Del.

Filed Sep. 28, 1982, Ser. No. 425,241

Int. Cl.⁴ B23P *19/00;* **B25C** *11/00*

U.S. Cl. 29—426.5 **10 Claims**





1. A method for fastening and detaching a protective cover sheet comprising:

(a) applying the cover sheet over goods to be protected,

(b) collecting a supply of preformed staples having a crown with a rectangular shaped depressed center section and corresponding raised end sections at each side of the crown,

(c) driving the staples through the cover sheet into goods to be protected with the center section forced against the cover sheet leaving the raised end sections extending upwardly from the cover sheet,

(d) inserting a three pronged tool under the driven staples, the tool comprising:

(i) a center prong of sufficient size and shape to be inserted over and abut the depressed center section of the staple, and

(ii) two side prongs of sufficient size and shape to be inserted under the two upraised end sections of the staple, and

(e) lifting on the tool to apply upward pressure from the two side prongs to the end sections to remove the staple.

4,691,428

SPANNER FOR TORSION SPRINGS AND METHOD FOR ITS USE

David A. Engstrom, R.D. 2, Sugar Grove, Pa. 16350

Continuation-in-part of Ser. No. 647,844, Sep. 6, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 851,454

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—426.6 **6 Claims**

1. A method of removing a torsion spring from a winding cone to which the spring is torque locked comprising the steps of applying a torsional force to a terminal end of said spring on said cone, said torsional force acting counter to the torsion lock while simultaneously applying a lifting force which moves said terminal end of said spring radially outwardly away from said cone.

4,691,429

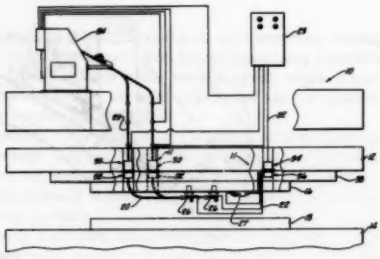
QUICK DISCONNECT COUPLER

Dale H. Goodsmith, Brighton, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Filed Apr. 8, 1986, Ser. No. 849,323

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—432 **33 Claims**



1. A quick disconnect normally interconnecting a source of self-attaching fasteners to at least one installation head, the installation head being mounted within one die shoe of a reciprocal press with a clinch die mounted in the other die shoe opposite the installation head, the press having relatively moveable plattens upon which the removable die shoes are mounted and, upon relative movement of the plattens, the installation head installs fasteners in a panel located between the installation head and the clinch die, the quick disconnect comprising:

a plurality of receptacle means mounted in one of the plattens, the receptacle means having a first fastener flow passage therethrough communicating with the source of self-attaching fasteners;

a plurality of plug means mounted in the one die shoe with at least one of the plug means being coaxially aligned with at least one of the receptacles, each plug means having a second fastener flow passage adapted to communicate between the first passage in the receptacle means and the installation head; and

a plurality of closure means each positioned in a respective first passage to close the first passage and prevent the advance of fasteners when a plug means is absent and to open the passage and permit the advance of fasteners when a plug means is present.

4,691,430

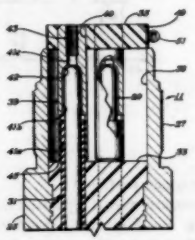
METHOD AND MEANS FOR SEALING ELECTRICAL CONDUCTOR RODS IN A TUBULAR HOUSING

Dale E. Wheeler, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 16, 1985, Ser. No. 809,355

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—451 **3 Claims**



1. A method of sealing at least one electrical conductor rod inside a tubular housing for connecting an electrical conductor through a pressure barrier structure, comprising in combination:

placing the rod in the housing and injecting epoxy around the central portions of the rod, leaving the opposite ends exposed, and allowing the epoxy to harden; then on each end of the housing,

inserting a hollow installation pin over the end of the rod;

providing an elastomeric circular grommet with a tight fitting hole for the conductor rod, and providing the grommet with an outer diameter that is greater than the inner diameter of the housing;

inserting the grommet over the pin, squeezing the grommet, and starting insertion of the grommet into the housing;

placing a mandrel on the grommet, the mandrel having a hole for receiving the pin;

moving the mandrel forwardly to drive the grommet into contact with the hardened epoxy; then

removing the installation pin and the mandrel, allowing the grommet to tightly seal around the rod and in the housing.

4,691,431

METHOD OF MAKING A METAL MOLD FOR TIRE VULCANIZATION

Naohiro Hayata, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Continuation of Ser. No. 786,907, Oct. 15, 1985, abandoned. This application May 27, 1986, Ser. No. 867,592

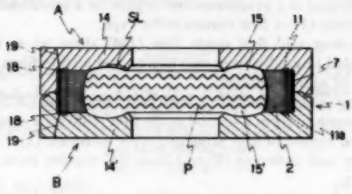
Claims priority, application Japan, Oct. 31, 1984, 59-230590

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—526 R **6 Claims**

4. A method for making a metal mold for tire vulcanization comprising slicing a tire into a plurality of laminas parallel to an equator plane of the tire, preparing a plurality of metal or

the like laminas each of which has an internal molding portion corresponding to sectional shape of an outer surface of a tire from the external configuration of said laminas of the tire



stacking up and fixing the obtained laminas in order to define an internal shape on said mold corresponding to the external tread of a tire to be vulcanized therein.

4,691,432

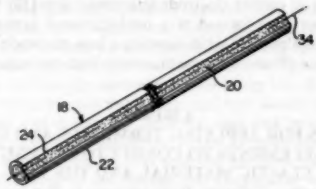
A METHOD OF MAKING A REINFORCED HARD POROUS INK ROLL ASSEMBLY

Doyle V. Haren, Clyde, N.C., and Lawrence V. Wiley, Putnam County, Tenn., assignors to Day International Corporation, Dayton, Ohio

Filed Oct. 9, 1985, Ser. No. 785,705

Int. Cl.[4] B22D *11/01*; B32B *31/22*; B41J *27/12*

U.S. Cl. 29—527.2 **15 Claims**



1. A method of making an inking roll including a hard porous inking material encompassed by a hard ink resistant material over a substantial portion of an outside surface of said inking roll comprising

providing a cover member of said ink resistant material having a generally hollow interior,

filling said hollow interior with a polymeric material capable of yielding said hard porous material upon curing,

curing said polymeric material in said cover member to cure said polymeric material into said hard porous material and,

removing only a portion of said cover member to exteriorly expose only a portion of said hard porous material.

4,691,433

HYBRID EXTENDED DRAIN CONCEPT FOR REDUCED HOT ELECTRON EFFECT

Joseph M. Pimbley; Gennady Gildenblat; Ching-Yeu Wei, all of Schenectady, N.Y., and Joseph Shappir, Jerusalem, Israel, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 722,642, Apr. 12, 1985, Pat. No. 4,613,882.

This application Apr. 30, 1986, Ser. No. 857,283

Int. Cl.[4] H01L *21/425*

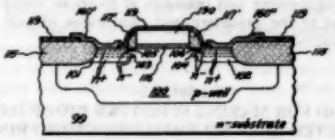
U.S. Cl. 437—44 **7 Claims**

1. A method for producing source or drain region structures in field effect transistor devices, said method comprising the steps of:

(a) implanting a light concentration of a first polarity dopant a fixed distance beneath the surface of a semiconductor body;

(b) implanting a second light dopant concentration of the same first polarity adjacent to the surface of said semiconductor body and spaced vertically apart from said region of dopant implanted a fixed distance beneath said semiconductor surface; and

(c) forming a source or drain region in said semiconductor body, said source or drain region including a heavy concentration of said first polarity dopant and extending



downwardly from the surface of said semiconductor body so as to include said lighter doped region and extending horizontally, said horizontal extension of said source or drain region being limited by implant screen means so as to define lighter doped protrusions extending from said heavily doped source or drain region, said light concentration being substantially smaller than said heavy concentration.

4,691,434

METHOD OF MAKING ELECTRICALLY CONDUCTIVE REGIONS IN MONOLITHIC SEMICONDUCTOR DEVICES AS APPLIED TO A SEMICONDUCTOR DEVICE

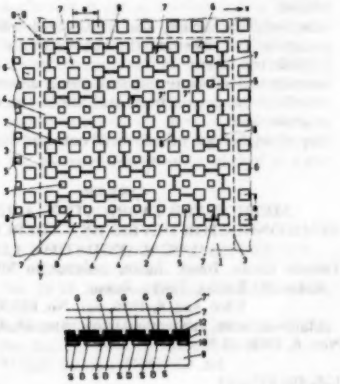
Richard Percival, Au/Zh, and Ernst Uhlmann, Stettfurt, both of Switzerland, assignors to Lasarray Holding AG, Thundorf, Switzerland

Filed Feb. 4, 1983, Ser. No. 463,817

Claims priority, application Switzerland, Feb. 19, 1982, 1036/82

Int. Cl.[4] H01L *21/44*

U.S. Cl. 437—173 **10 Claims**



10. A method of patterning a conductive film on and, at least, partially connected to a semiconductor substrate for use in the fabrication of monolithic integrated semiconductor devices, comprising the steps of:

forming in said conductive film a plurality of at least in part regularly repeated openings;

during said step of forming said plurality of openings in said conductive film, forming said openings at predetermined locations;

subsequent to the formation of said plurality of openings in

said conductive film, removing parts of said conductive film along predetermined lines linking a preselected number of said openings in said conductive film in order to thereby obtain insular conductive areas of predetermined dimensions constituting the conductive parts of monolithic integrated semiconductor devices; and

said step of forming said plurality of openings in said conductive film at said predetermined locations entailing the step of forming said openings at locations which correspond to the predetermined dimensions of said insular conductive areas.

4,691,435

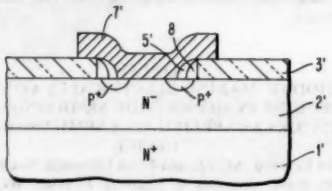
METHOD FOR MAKING SCHOTTKY DIODE HAVING LIMITED AREA SELF-ALIGNED GUARD RING

Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia; Santosh P. Gaur, both of Wappingers Falls, all of N.Y., and John L. Mauer, IV, South Kent, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1981, Ser. No. 263,227

Int. Cl.[4] H01L *21/385*

U.S. Cl. 437—175 **13 Claims**



1. The method for making a self-aligned guard ring Schottky barrier diode comprising

depositing a dielectric layer on a silicon substrate, anisotropically etching said dielectric layer to produce a substantially vertically walled hole therein,

depositing a doped silicon layer over said etched dielectric layer,

reactively ion etching said silicon layer anisotropically to expose said substrate through said hole in said etched dielectric layer,

heating said substrate and said doped silicon layer so as to diffuse the dopant from said silicon layer into said substrate, and

depositing Schottky diode metal onto said exposed substrate.

4,691,436

METHOD FOR FABRICATING A BIPOLAR SEMICONDUCTOR DEVICE BY UNDERCUTTING AND LOCAL OXIDATION

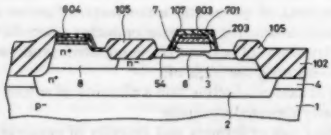
Tadashi Hirao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,934

Claims priority, application Japan, Aug. 14, 1985, 60-179732; Nov. 6, 1985, 60-249610

Int. Cl.[4] H01L *21/302, 21/314*

U.S. Cl. 437—33 **10 Claims**



1. A method for fabricating a semiconductor device which has an emitter region (7), a collector region (3, 8), and a base region consisting of a base electrode lead-out region (54) and an active base region (6), said method comprising the steps of:

forming multilayer having a silicon film (600), a nitride film (202) and a first oxide film (104) stacked in the order mentioned at a predetermined region on a semiconductor substrate (1) of first conductivity type,

side-etching said first oxide film (104) alone so as to be receded inwardly from said silicon and nitride films (600, 202) of said multilayer,

effecting selective oxidation with said nitride film (202) used as a mask to form a second oxide film (105) on a predetermined region of said semiconductor substrate (1) for isolating said collector (8) and base (54) regions from each other,

selectively etching away said silicon and nitride films (600, 202) by using said side-etched first oxide film (104) as a mask,

forming a third oxide film (106) on the region which serves as said base electrode lead-out region (54) by effecting selective oxidation using said selectively etched nitride film (202) as a mask,

introducing impurity of said first conductivity type into said silicon film (602) by using said third oxide film (106) as a mask,

forming said emitter (7) and base (6) regions by introducing an impurity of second conductivity type with said second oxide film (105) used as a mask and then applying a heat treatment,

forming an insulation film (107, 203) on the side wall of said silicon film (603) by using anisotropic etching, and

forming an emitter electrode interconnection (10) through a contact hole formed in a predetermined region of said silicon film (603) while forming a base electrode interconnection (9) on said base electrode lead-out region (54).

4,691,437

DEVICES FOR APPLYING TERMINALS AND SIMILAR METAL ELEMENTS TO CONDUCTORS, LENGTHS OF ELASTIC MATERIAL AND THE LIKE

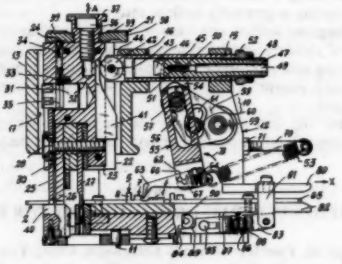
Franco Vaglini, Gallarate, Italy, assignor to Siac Industria Accessori Cavaria S.p.A., Varese, Italy

Filed Jan. 27, 1986, Ser. No. 823,080

Claims priority, application Italy, Feb. 21, 1985, 19597 A/85

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—753 **14 Claims**



1. An improved device for applying terminals and similar metal elements to conductors, to lengths of elastic material and to other filiform bodies, starting from a strip composed of an interconnected succession of such elements, said device comprising a load-bearing structure, a controllable mobile head carrying tools for detaching an element from the strip and applying it to the end of the filiform body, strip feed means driven by the movement of the head by way of a cam and comprising a roller cooperating with said cam, and means for adjusting the feed and the point of commencement of the feed, characterized in that in the feed means a pawl, which is loaded

by a spring, is mounted on a lever which has an adjustable fulcrum and is hinged to slider means carrying the roller, said adjustable fulcrum forming part of the feed adjustment means and a hinge of adjustable position forming part of the means for adjusting the feed commencement point.

4,691,438

CONSTANT FORCE MANUAL GLASS CUTTER

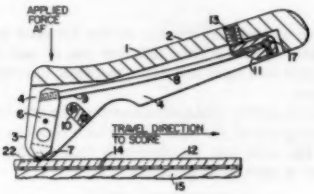
Thomas A. Insolio, 22 Elaine Dr., Bristol, Conn. 06010

Filed Feb. 11, 1985, Ser. No. 700,410

The portion of the term of this patent subsequent to Feb. 8, 2004, has been disclaimed.

Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—164.95 13 Claims



4. A hand held glass cutter for scoring flat glass and comprising, an elongated handle having one end provided with spaced furcations to define a downwardly open slot, a tool holder received in said slot and movable between first and second positions therein, an elongated leaf spring provided for movement in a recess defined by said handle, said spring having one end in engagement with said tool holder and an opposite end mounted to said handle, said tool holder being biased toward said first position by said leaf spring, said tool holder having a glass scoring tool in one end such that said tool projects beyond the ends of said handle furcations by approximately $\frac{1}{8}$ inch when said tool holder is in said first position, adjustable stop means defined in said handle and engageable with said spring to define said first position, said second tool holder position achieved by deflection of said leaf spring and corresponding movement of said tool holder inwardly of said slot such that said handle furcation ends of said handle contact the surface of the glass being scored to limit the manual scoring force on the glass in spite of excessive force exerted by the user's hand on the handle as a result of such contact between said handle furcation ends and the glass.

4,691,439

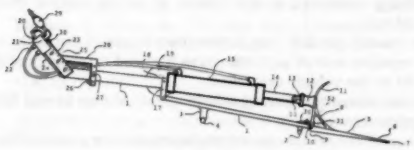
POWERED ROOF SHINGLE DETACHER AND STRIPPER APPARATUS

Gerardo J. Marra, P.O. Box 836, River Edge, N.J. 07410-0836

Filed Nov. 3, 1986, Ser. No. 929,072

Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—170 9 Claims



1. A powered roof shingle detacher and stripper apparatus, comprising;

(a) a frame;

(b) a rolling means under a front part of the frame to make the apparatus easy to move;

(c) a fulcrum means under a middle part of the frame to enable the apparatus to be rocked and to increase the mechanical advantage to detach the shingles and which also includes a rolling means;

(d) a shovel-like device comprising a blade located at the front part of the frame with a plurality of nail body engaging slots at the front end, wherein the blade is flat to turned up relative to a rear section;

(e) a pivot beneath the junction where the blade and the rear section meet to enable the blade to move down to properly position said blade for insertion under the shingles and to move up to raise and detach the shingles while engaging and pulling out nails;

(f) an arm attached to the rear section which accumulates the shingles after stripping and pushes them off a roof or stacks them in a pile;

(g) a handle joined to the rear section which attaches to an end mount of a cylinder shaft at one end of a gas cylinder by an unfixed pin assembly which allows the handle and the gas cylinder to move at varying angles to each other, said gas cylinder attached to a hinge fixed to the frame at the other end;

(h) a front grip and a guard attached to the middle of the frame which can be grasped with one hand to manipulate the apparatus in concert with a rear grip attached to the rear of the frame which can be grasped with the other hand;

(i) a control mechanism mounted on the rear grip which uses compressed gas as a power medium to activate the gas cylinder, wherein the control mechanism, the rear grip, the front grip, and the guard are extended to a plurality of locations at various angles relative to the frame to accommodate various pitches of the roof, different bodily positions of operation and also to change the amount of leverage exerted;

(j) a hose and fitting assembly which connects the control mechanism to the gas cylinder and which also connects the control mechanism to a compressed gas source to power the apparatus, wherein, when the control mechanism is in one setting, the cylinder shaft within the gas cylinder is pushed out by gas flow and acts on the handle to push the blade down, ready to be inserted under the shingles, and when the blade is moved under the shingles, the control mechanism is put in another setting and the cylinder shaft is brought back to its original closed position within the gas cylinder by the gas flow, thus raising the blade to exert leverage and to detach the shingles while the slots in the blade engage nail bodies and press upward against nail heads and pull out nails, and as the apparatus is rocked in a forward direction, the shingles with the nails attached are stripped by the blade and accumulated and pushed off the roof or stacked in a pile by the arm.

4,691,440

FORKED SHELL AND MEMBRANE STRIPPER FOR BOILED EGGS

Hideji Ushigome, No. 19-15, 3-chome, Kugayama, Suginami-ku, Tokyo, Japan

Continuation of Ser. No. 688,760, Jan. 4, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 878,509

Int. Cl.[4] A47J *43/28*

U.S. Cl. 30—322 2 Claims

1. A forked shell and membrane stripper for boiled eggs capable of simultaneously stripping the shell and membrane of the boiled eggs consisting of a stem portion and a forked portion comprising a central fork having a free end formed with a

head and two elongate side members straddling the central fork, the side members having front ends remote from the stem portion which are bridged by a cross-piece to constitute a guide face for guiding the central fork while sliding on the outer surface of the egg-shell so that the central fork may creep under the membrane of the boiled egg, said central fork and side members being curved longitudinally, the central fork extending from a junction with the stem portion at a level under the side members, passing through a plane containing the side members and protruding at its free end to a level above the side members, and the head of the central fork terminating short of the cross-piece, with a nipping gap formed between the head, the cross-piece and the side members for cutting open the shell and membrane simultaneously.

4,691,441

THREAD GAUGE

Charles A. Van Horssen, 9233 N. 12 Ave., Phoenix, Ariz. 85021

Filed Jan. 28, 1987, Ser. No. 8,278

Int. Cl.[4] G01B *3/48, 5/16*

U.S. Cl. 33—199 R **2 Claims**

1. A thread measuring tool comprising

(a) an elongate helical neck having a longitudinal axis and a first end and a second end;

(b) a threaded gauge attached to said first end of said neck;

(c) a drive member slidably mounted on said neck and having an inner helical surface slidably contacting said neck and shaped and dimensioned such that linear non-rotational displacement of said drive member along said neck in a direction of travel generally parallel said longitudinal axis generates forces on said helical neck causing said neck and threaded gauge to rotate.

4,691,442

SIGHT SYSTEM FOR A FIREARM

Warren A. Center, Alton Bay, N.H., assignor to K. W. Thompson Tool Company, Inc., Rochester, N.H.

Filed Apr. 2, 1986, Ser. No. 847,698

Int. Cl.[4] F41G *1/02, 1/10*

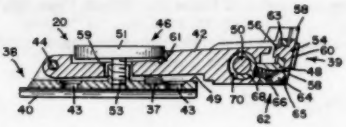
U.S. Cl. 33—253 **7 Claims**

5. Rear sight fixture for a gun barrel having a rearward end, a forward end, and outer surface and a central longitudinal axis which correlates with a sight axis which is located above said barrel and which is substantially parallel with said central longitudinal axis, said rear sight fixture comprising:

(a) a rear bracket which is adapted to lie along said outer surface at the rearward end of the gun barrel beneath said sight axis,

(b) fastening means for removably fastening the rear bracket to the barrel,

(c) a rear sight carrier which has a plurality of sight slots, each of said sight slots having a different width than the other slots within a plane which is tranverse to said sight axis, said rear sight carrier being mounted on said rear bracket for selective movement to a plurality of positions



relative to said rear bracket so that for each position of said rear sight carrier, a different one of said sight slots intersects said sight axis and constitutes the rear sight of the gun,

(d) a biased detent which is mounted in the rear bracket for engaging one of the sight slots which is not in alignment with the sight axis for yieldingly locking the rear sight carrier in each of its positions.

4,691,443

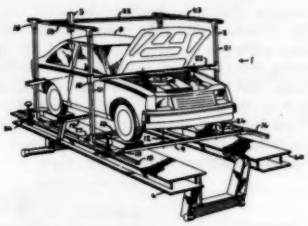
DRIVE-IN, DRIVE-OUT VEHICLE ALIGNMENT SYSTEM

Harold F. Hamilton, Liberty, Mo., and Robert L. Donahue, McPherson, Kans., assignors to Hein-Werner Corporation, Waukesha, Wis.

Division of Ser. No. 844,030, Mar. 24, 1986, which is a continuation-in-part of Ser. No. 764,678, Aug. 12, 1985, Pat. No. 4,598,481. This application Sep. 22, 1986, Ser. No. 910,084

Int. Cl.[4] G01B *5/03, 11/03*

U.S. Cl. 33—288 **10 Claims**



1. A drive-in, drive-out alignment system comprising:

(a) first and second transverse bars and hanger means extending therefrom for connection to a first vehicle, said first transverse bar being connected to the vehicle forward of the vehicle front wheels, and said second transverse bar being connected to the vehicle aft of the vehicle front wheels;

(b) spaced, parallel longitudinal bars mounted normally to opposite ends of said transverse bars and extending parallel to the vehicle centerline;

(c) tee connectors joining said longitudinal bars to said first transverse bar;

(d) quick couple tee connectors joining said longitudinal bars to said second transverse bar for ready connection and disconnection; and

(e) support means extending from said longitudinal bars to a base surface and maintaining said longitudinal bars a set distance thereabove; whereby said second transverse bar is removable by said quick couple tee connectors and said longitudinal bars remain supported for ease of removing and replacing said vehicle with a second vehicle and

quickly repositioning said second transverse bar to said second vehicle for alignment.

4,691,444

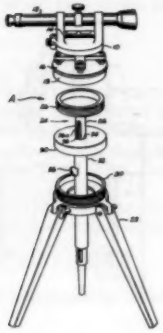
SURVEYOR'S LEVEL WITH CONSTANT INSTRUMENT HEIGHT AND METHOD

Grover Capps, Rte. 2, Box 388, Travelers Rest, S.C. 29690

Filed Apr. 1, 1986, Ser. No. 846,637

Int. Cl.[4] G01C *5/00*

U.S. Cl. 33—290 **18 Claims**



1. A method of constructing a surveyor's instrument mounted on a tripod for use in a surveying method wherein the instrument height determined by sighting through the surveyor's instrument to a prescribed benchmark may be reset at a constant height with respect to said benchmark with the tripod moved on a job site to different locations wherein the method comprises:

providing an elevatable base carried by said tripod on which said surveying instrument is mounted;

providing adjustment means for adjusting the vertical position of said elevatable base relative to said tripod in a manner that said elevatable base may be set to said instrument height upon repeated set-ups of said tripod whereby a constant instrument height can be used throughout the calculations of the surveyor at the job site;

providing a first adaptor member in the form of an adaptor collar which threadably mates with a base cap of said surveying instrument, and said adaptor collar having an integral elongated shaft; and

providing second adaptor member in the form of an adaptor base cap which threadably mates with a threaded collar of said tripod, and providing said adaptor base cap with an elongated sleeve which slideably receives said elongateg shaft of said adaptor collar.

4,691,445

HORIZONTAL EVALUATION DATUM SCOPE

Loranza D. Fields, Jr., P.O. Box 1181, Chicago, Ill. 60126

Filed Oct. 29, 1985, Ser. No. 792,539

Int. Cl.[4] G01C *5/04*

U.S. Cl. 33—367 **7 Claims**

1. An apparatus for establishing a horizontal plane on an object structure at a predetermined level corresponding to the bottom of a workpiece, comprising:

a housing;

means associated with said housing defining a first liquid reservoir;

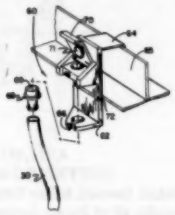
means defining a second liquid reservoir, each of said first and second reservoirs being vented to the atmosphere and having a translucent portion such that the level of a liquid in said reservoirs is viewable through said translucent portion from outside said reservoirs;

attachment means associated with said housing for securing said housing to said workpiece;

a reference marking on said housing in visual juxtaposition with said translucent portion of said first reservoir and correlated with said attachment means to correspond to the bottom of said workpiece;

a reference marking on said second reservoir-defining means in visual juxtaposition with said translucent portion of said second reservoir;

liquid-conducting means for placing said first and second reservoirs in closed communication with each other; and



means for introducing a quantity of liquid into said reservoirs and said liquid-conducting means sufficient to fill said liquid-conducting means and to fill said reservoirs to a level corresponding to their respective reference markings such that when the elevation of said second reservoir is adjusted relative to the object structure until the liquid level in said second reservoir corresponds to said reference mark associated therewith, said reference mark then corresponds on the object structure to said predetermined level corresponding to the bottom of said workpiece.

4,691,446

THREE-DIMENSIONAL POSITION MEASURING APPARATUS

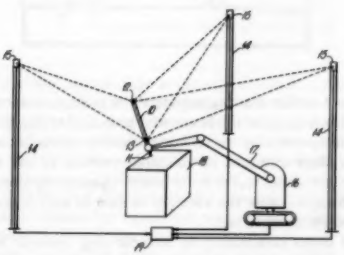
Brian E. Pitches, and David A. Wright, both of Edinburgh, Scotland, assignors to Ferranti plc, Cheshire, England

Filed Sep. 2, 1986, Ser. No. 902,655

Claims priority, application United Kingdom, Sep. 5, 1985, 8522058

Int. Cl.[4] G01C *3/10*

U.S. Cl. 33—516 **6 Claims**



1. Three-dimensional position measuring apparatus for determining the position of a point movable throughout a measuring volume relative to a set of reference axes, which apparatus includes a probe member having a probe tip defining the position of the movable point and first and second reference points spaced apart from one another and having a fixed known spatial relationship with one another and with the probe tip, means for moving the probe member so that the

probe tip may be positioned at any desired point within the measuring volume, at least three distance meansuring equipments, each being located outside the measuring volume in a separate fixed known position relative to the set of reference axes and each operable to determine the distance between its known position and each reference point on the probe member, and calculating means responsive to the signals derived by each distance measuring equipment to determine the position of the probe tip relative to the set of reference axes.

4,691,447

COFFEE ROASTER

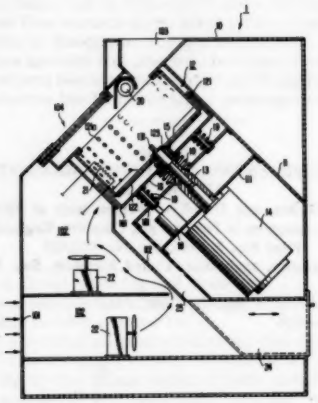
Masayuki Nakai, Isesaki; Kikuo Ishikawa, Ashikaga, and Shiro Okada, Isesaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jul. 31, 1985, Ser. No. 760,836

Claims priority, application Japan, Jul. 31, 1984, 59-117949[U]; Jul. 31, 1984, 59-117950[U]

Int. Cl.[4] F26B *11/08*

U.S. Cl. 34—4 **8 Claims**



1. In a coffee roasting apparatus including a rotatable drum at an acute angle to the horizontal provided with a plurality of holes for promoting the roasting of coffee beans, a coffee bean supply duct arranged at an upper portion of the apparatus above said drum and a drive means operatively connected to said drum to cause the rotating motion of said drum, the improvement comprising:

said drum comprising an annular ring element having an upper opening and a bottom opening, and a bottom plate adjacent said bottom opening and axially slidably attached on said drive means for controlling the opening and closing of said bottom opening of said ring element to provide a discharge path for the roasted coffee beans;

a plurality of stirring blades formed on an inner surface of said ring element; and

an infrared heater placed adjacent to said upper opening of said ring element for roasting the coffee beans by the infrared radiation heat.

4,691,448

APPARATUS AND PROCESS FOR DRYING FINELY GRAINED SOLID PARTICLES

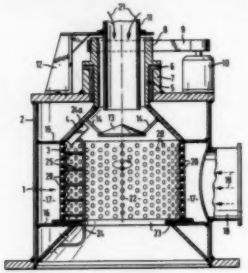
Franz Alstetter; Herbert Schiele, both of Karlsfeld; Peter Sedlmayer, Munich, and Günther Hultsch, Oberschleissheim, all of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Krauss-Maffei, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,409

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430127

Int. Cl.[4] F26B *5/08*

U.S. Cl. 34—8 **23 Claims**



1. A centrifugal drying apparatus for drying finely grained solid particles suspended in a fluid bed comprising:

a means for housing the drying apparatus;

means for screening solid particles wherein said means for screening exhibits a plurality of solid particle screening bores which allow passage of drying gas, said means for screening surrounds and defines a swirl chamber and is rotatingly mounted within said means for housing;

means for charging the drying apparatus connected to said means for screening;

means for introducing drying gas through said plurality of bores into the swirl chamber, wherein said solid particles and said drying gas form a fluid bed in said means for screening;

means for agitating mechanically said solid particles in the fluid bed.

4,691,449

METHOD AND APPARATUS FOR DRYING A MOIST FIBRE WEB

Per-Arne Wiberg, Gunnars Väg 5, S-723 55 Västerås, Sweden

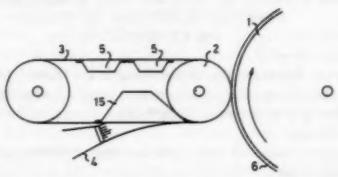
PCT No. PCT/SE85/00009, § 371 Date Aug. 16, 1985, § 102(e) Date Aug. 16, 1985, PCT Pub. No. WO85/03314, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 11, 1985, Ser. No. 775,054

Claims priority, application Sweden, Jan. 19, 1984, 8400256-7

Int. Cl.[4] F26B *5/16*

U.S. Cl. 34—9 **11 Claims**



1. In a method for drying a moist fiber web (6), in which the web downstream of a forming unit is taken up on a wire (9) and advanced to a press nip (13) via a couch roll (10), a pick-up felt

(11) and a suction press roll (8), and the fiber web is transferred in the press nip (13) to the periphery of a drying cylinder (1); the improvement comprising carrying the web on the outer cylindrical surface of said cylinder to a drying press, and in the drying press pressing against the moist fiber web (6) a permeable press means at a temperature above 100° C. and including a press roll (2, 18) so that water is extracted from the fiber web and enters the permeable press means, extracting said water from the press means with the aid of suction boxes (5, 16, 19) within said press means, retaining the fiber web (6) from which water has been extracted on the drying cylinder (1) downstream of the press nip of said press means, and then removing the dried web from the drying cylinder.

4,691,450

METHOD AND APPARATUS FOR THE REMOVAL OF LIQUID FROM A RUNNING YARN

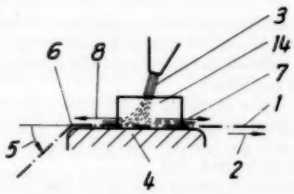
Dieter Glaser, Karl Marx Stadt, and Theobald Klemm, Dittersdorf, both of German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Oct. 17, 1985, Ser. No. 788,275

Claims priority, application German Democratic Rep., Jan. 7, 1985, 272437

Int. Cl.[4] F26B *3/04*

U.S. Cl. 34—23 **13 Claims**



1. Method for removing liquid from a running yarn exclusively by the squeezing action of a jet of gas, comprising passing a wet yarn in running contact with a surface bounded by means for forming the side walls of a channel of which said surface defines the bottom, and directing a jet of gas approximating the width of the channel downwardly into the channel so that it impinges on the yarn and is deflected off the bottom of the channel, the gas surrounding and squeezing the yarn in the channel thereby to squeeze liquid from the yarn.

4,691,451

HAIR DRYER

Roberto Giorgis, Via Casilina Vecchia, 27, 00182 Roma, Italy

Continuation of Ser. No. 663,747, Oct. 23, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 930,058

Claims priority, application Italy, Oct. 2, 1984, 48937 A/84

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—68 **10 Claims**

1. A hair drying apparatus for drying hair on a person's head comprising:

an electric motor;

a plurality of hair drying lamps for drying the hair;

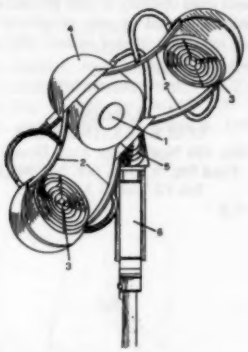
arms for supporting said lamps;

a mechanism for transmitting motion from said motor to said arms and said lamps, said mechanism including

a head assembly having a first support means, a grooved pulley journalled in said first support means, second support means, a slide means supported by said second support means and lying within said groove, said first support means being pivotal with respect to said second support means,

a neck assembly connected to said head assembly, said neck assembly including a rocker arm rigidly fixed to said second support means and a cam rigidly fixed to said first support means; and

base means for supporting the rocker arm for pivotal movement about an axis which is transverse to the rocker arm,



said base means having a surface rigidly fixed thereto for contacting said cam, said motor causing said grooved pulley to rotate whereby said mechanism moves said arms and said lamps around the head and hair to direct the lamps toward different areas of the hair on the head.

4,691,452

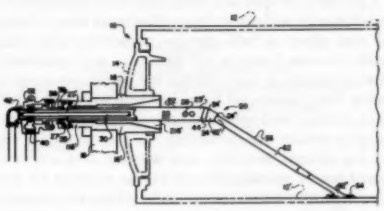
ARTICULABLE SIPHON TUBE ASSEMBLY FOR DRYER DRUM

George R. Ferguson, Clover, S.C., assignor to Duff Norton Company, Charlotte, N.C.

Filed Jul. 18, 1986, Ser. No. 887,888

Int. Cl.[4] F26B *25/20*

U.S. Cl. 34—119 **17 Claims**



1. An articulable siphon tube assembly for use in a hollow rotary dryer drum having a tubular journal with an axial opening therethrough, said siphon tube assembly being particularly adapted for selective articulation for insertion into and removal from said drum through said axial opening of said journal and for siphoning disposition within said drum at a peripheral drying wall thereof, said siphon tube assembly comprising:

support tube means for operative positioning within said axial opening of said journal of said drum;

siphon tube means for operative positioning within said drum at said peripheral wall thereof; and

tubular elbow means disposed intermediate and connected with said support tube means and said siphon tube means in respective end-to-end communication, said elbow means being rotatably connected to one of said support tube means and said siphon tube means for rotation annularly with respect thereto about an axis angularly oriented with respect to both thereof and being fixed to the other thereof for selective rotation of said elbow means and said other tube means to orient said support tube means and

said siphon tube means either in general alignment with one another for permitting insertion and removal of said siphon tube assembly through said axial opening in said journal or at sufficient angular relation to one another for permitting mounting of said support tube means coaxially within said axial opening of said journal with said siphon tube means disposed at said peripheral drum wall for siphoning operation of said siphon tube assembly within said drum.

4,691,453

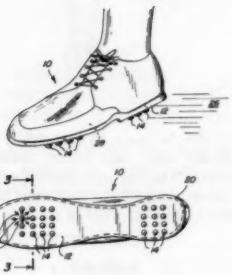
SPACE SKATING SHOE

Salustiano Tifre, 496 New Jersey Ave., Brooklyn, N.Y. 11207

Filed Sep. 8, 1986, Ser. No. 906,262

Int. Cl.[4] A43B *5/12, 5/16*

U.S. Cl. 36—8.3 **5 Claims**



1. A space skating shoe for recreation activities which comprises:

(a) a shoe portion for wearing upon the user's foot;

(b) a sole having a plurality of cavities recessed into the sole;

(c) means for attaching said sole to the bottom of said shoe portion; and

(d) a plurality of spherical balls rotatively mounted in said cavities with said cavities engulfing more than 180 degrees of said spherical balls thereby permitting said spherical balls to rotate freely in any direction, said spherical balls fitting loosely in said cavities but being prevented from being freely separated from said sole by the engulfing of said cavities, said spherical balls spacing said sole from a skating surface and permitting the user to propel himself in any desired direction, and wherein said sole is fabricated out of polytetrafluoroethylene material for permitting smooth rotation of the balls within the cavities and permitting forced removability of the spherical balls from the cavities for replacement of the spherical balls.

4,691,454

SKI BOOT CLOSURE SYSTEM

Marco T. Ottieri, Manchester, Mass., assignor to Ottieri Enterprises, Boston, Mass.

Continuation-in-part of Ser. No. 655,905, Sep. 28, 1984, Pat. No. 4,669,202, and a continuation-in-part of Ser. No. 664,991, Oct. 26, 1984, Pat. No. 4,565,017. This application Jan. 17, 1986, Ser. No. 820,405

Int. Cl.[4] A43B *5/04;* **A43C** *11/00*

U.S. Cl. 36—117 **12 Claims**

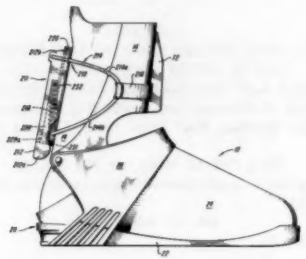
1. In a ski boot having a base element providing sole, toe and instep portions, a forward shin-cuff element mounted to said base element for supportingly engaging the shin of a wearer, a calf cuff element hingedly mounted to said base element for supportingly engaging the calf of a wearer, said cuff elements being movable between closed positions for providing said supporting engagements, and open positions for allowing a wearer to step into and out of the base element, and further having the improvement comprising a closure system for opening and closing said ski boot, said closure system comprising

(a) a cable system having height and length varying cable strands secured between one said cuff and a latch means mounted to the other said cuff,

(b) a means for slidably securing said cable strands to said one cuff,

(c) a latch means comprising a guide track and a lever, said guide track being mounted to the other said cuff, said lever being adapted for movement between open and closed positions, and

(d) said cable system having first, second, and third strand



portions, said forst portion extending on a first side of said boot from connection with said lever to said slideable securing with said one cuff and continuing to engagement with said guide track,

said third portion extending on the other opposite side of said boot from connection with said lever to said slideable securing with said one cuff and continuing to engagement with said guide track, and

said second portion interconnecting said first and third portions at the engagements thereof with said guide track and extending along said guide track for a length which changes with the position of said lever between said open and closed positions.

4,691,455

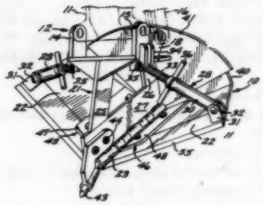
TRENCHING EQUIPMENT WITH HINGED SIDE PLATES

Russell L. Newman, 4591 Cathy Ave., Cypress, Calif. 90630

Filed Sep. 20, 1985, Ser. No. 778,030

Int. Cl.[4] E02F *5/02*

U.S. Cl. 37—103 **9 Claims**



1. An open top excavation bucket for forming trenches, comprising:

a. a support frame;

b. a pair of side plates hingedly connected along the lower edges thereof and supported from the support frame so that each of the side plates may be rotated about the axis of its hinge connection;

c. a back wall;

d. means connected to the side plates to adjust the orientation thereof about the axis of the hinge connection.

4,691,456

CONTAINER FOR STORING A STACK OF PICTURES

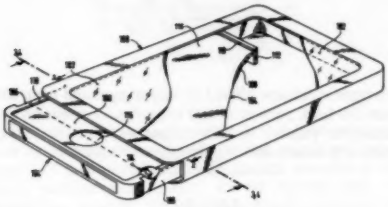
Peter Ackeret, Küsnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Sep. 30, 1983, Ser. No. 537,861

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236643

Int. Cl.⁴ G09F *3/18*

U.S. Cl. 40—10 R **14 Claims**



1. A container for displaying a single picture and storing a stack of pictures, said container comprising means defining first and second chambers and having separating means common to and separating said first and second chambers, said first chamber being for retaining a single picture and said second chamber being for storing a stack of pictures, said first chamber having a display window opposite said separating means, and said separating means being for holding a single picture in position for display and being shaped to retain the single picture in position at said window, said container further comprising first and second members movable relative to each other, each of said members defining at least one wall of each of said chambers, said container being closed against removal of pictures from either of said chambers when said first and second members are in a first relative position and said first and second chambers being accessible for picture removal when said first and second members are in a second relative position.

4,691,457

EMBLEM MOUNTING ASSEMBLY

Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 625,667, Jun. 28, 1984, abandoned. This application Oct. 22, 1984, Ser. No. 663,718

Int. Cl.⁴ G09F *3/08*

U.S. Cl. 40—20 A **16 Claims**

1. An emblem mounting assembly comprising an emblem having a front face and a rear face, a rod detachably secured to said emblem through said rear face of said emblem, locking means detachably secured to said rod for mounting said assembly to an object, said emblem including a nut receiving pocket, a nut trapped in said pocket and exposed through said rear face of said emblem, and said rod being threadably secured to said nut, said locking means including a hold down bar mounted on said rod, said emblem includes a shield and a hub unit secured together, and said pocket being formed in juxtaposed faces of said shield and said hub.

4,691,458

TAGS

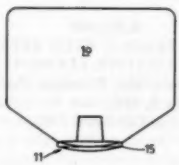
Michael J. Scott, Fielding, New Zealand, assignor to Allflex International Limited, Palmerston North, New Zealand

Filed Oct. 2, 1984, Ser. No. 657,075

Claims priority, application New Zealand, Oct. 3, 1983, 205842

Int. Cl.⁴ C09F *3/00*

U.S. Cl. 40—300 **6 Claims**



1. A tag for attachment to the ear of an animal, said tag comprising:

a female component having a base portion with an upper surface and lower surface;

a panel projecting upwardly from said upper surface;

an opening in said base portion;

said lower surface including an engagement surface which in use of the tag engages with the upper outer surface of an animal's ear, said engagement surface having a curved profile which, relative to the panel, is transverse to the plane of the panel and follows the contour of the upper outer surface of the animal's ear to which the tag is to be applied to resist swivelling movement of the tag about the axis of coupling of said female component.

4,691,459

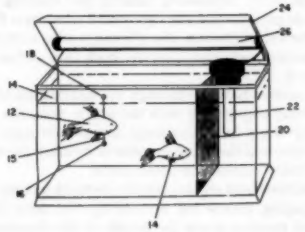
ARTIFICIAL AQUARIUM

George Butler, 62 Dacia St., Dorchester, Mass. 02125

Filed Feb. 3, 1986, Ser. No. 825,148

Int. Cl.⁴ G09F *19/00*

U.S. Cl. 40—406 **1 Claim**



1. A decorative artificial aquarium comprising:

a rectangular tank member having two opposite transparent first and second sides and two opposite transparent third and fourth sides shorter than said first and second sides;

water contained within said tank member;

at least one artificial fish freely floating at a predetermined level within said water;

a whirlpool pump positioned in said tank adjacent to one of its shorter sides, the water flow from said pump directed

to cause circular movement of water around the inside of said tank to carry said artificial fish around in a circular path in said tank member; and

a baffle positioned at one end of said tank extending between said first and second sides adjacent to said whirlpool pump to prevent said artificial fish from being drawn into the intake of said whirlpool pump said baffle extending across said tank member forming a wall separating said tank member into a first and second chamber, said first chamber containing said whirlpool pump causing said circular water circulation and said second chamber containing said artificial fish moved in a circular path at a predetermined level in said water by said circular water circulation and said baffle further having a plurality of apertures defined therein allowing water flow therethrough but preventing said fish from entering said first chamber to keep said fish away from said whirlpool pump.

4,691,460

DECORATIVE PLAQUE WITH REPLACEABLE DECORATIVE ELEMENT

Jerry Kohl, 800 Holladay Rd., Pasadena, Calif. 91106

Filed Sep. 9, 1985, Ser. No. 774,027
Int. Cl.[4] G09F *7/02*
U.S. Cl. 40—618 **16 Claims**

1. An elongated decorative plaque suitable for mounting on belts comprising:

(a) a frame comprising:

(i) an elongated cover plate having an elongated opening therethrough, the cover plate having a decorative front face and a back face; and

(ii) a backing place similar in shape to the cover plate and adapted for removable attachment to the cover plate, the backing plate having a front face and a back face;

(b) at least one replaceable decorative element sized and adapted for removable insertion between the cover plate and the backing plate such that at least an exposed portion of the decorative element shows through the opening of the cover plate, each decorative element being no wider than the length of the elongated opening, the decorative element having a front face and a back face;

(c) means for removably affixing the backing plate to the cover plate so that the decorative element is firmly held in place therebetween, the affixing means comprising

(i) screw nuts affixed to the back face of the cover plate; and

(ii) screws passing through the backing plate and threadingly engageable with the screw nuts, the screws each having a head too large to pass through the backing plate and therefore capable of holding the backing plate firmly against the cover plate;

the frame and the decorative element having interlocking engaging means for preventing the decorative element from moving along the length of the elongated opening.

4,691,461

ADJUSTABLE GUN TRIGGER MECHANISM

Austin Behlert, R.D. #2, Box 63, Pipersville, Pa. 18947

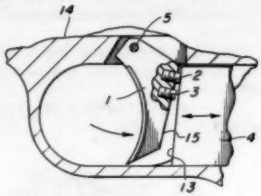
Filed Oct. 14, 1986, Ser. No. 917,919
Int. Cl.[4] F41C *19/02*
U.S. Cl. 42—69.01 **6 Claims**

6. A trigger mechanism for a firearm, comprising:

a. a trigger housing,

b. a trigger pivotably affixed to said trigger housing, the trigger having a back portion for engaging a firing mechanism,

c. an actuator being part of said firing mechanism and located in contacting relationship with the back portion of said trigger, and



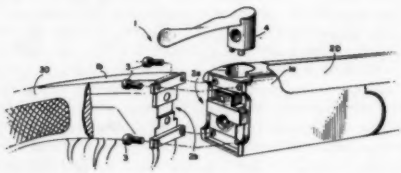
d. a trigger extension affixed to said trigger and protruding from the back portion of said trigger, said extension being adjustable relative to said trigger to alter the point of contact between said trigger and said actuator.

4,691,462

BREAK-OPEN ACTION FOR SPORTING RIFLES

Ennio Mattarelli, Zola Predosa, Italy, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Mar. 26, 1986, Ser. No. 844,134
Claims priority, application Italy, Mar. 26, 1985, 4830/85[U]
Int. Cl.[4] F41C *7/00*
U.S. Cl. 42—75.04 **2 Claims**



1. A break-open action for sporting rifles, the break open action comprising a forward part for connection with at least one rifle barrel, means for releasably locking the forward part with a rearward part including snug seat means and fastening means, the rearward part including lock means for connection with a rifle stock, and wherein said seat means enables an angular adjustment about an axis disposed in a plane of the snug seat means.

4,691,463

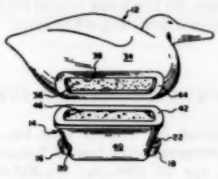
BUOYANT WATER FOWL DECOY AND METHOD FOR MAKING SAME

James A. DeKezel, 2300 79th Ave. W., Lot 97, Rock Island, Ill. 61201, and James R. Lerschen, 218 Elm St., Colona, Ill. 61241

Continuation of Ser. No. 397,551, Jul. 12, 1982, Pat. No. 4,450,642. This application Mar. 19, 1984, Ser. No. 591,120
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **10 Claims**

1. A water fowl decoy comprising: a hollow shell body portion which has the shape of a water fowl decoy, which has an interior chamber, and which is made of a hard, rigid plastic material; a buoyant foam plastic material within and substantially filling said interior chamber of said shell body portion; said hollow shell body portion being closed except for an opening in a bottom portion thereof for injection of said buoyant foam plastic material into said interior chamber through said opening; and a hollow, elongate, plastic keel shell portion

which is mounted to said shell body as one piece, which depends from said bottom portion of said shell body portion, which has an interior chamber and which has an opening in an upper portion thereof and an opening in an exterior wall thereof, said shell body portion being in communication with said interior chamber in said keel shell portion through said openings in said shell body portion in said upper portion of said



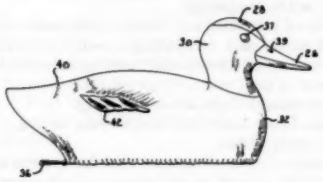
keel shell portion whereby said buoyant foam plastic material can be inserted through said opening in said exterior wall of said keel shell portion into said interior chamber in said shell body portion and allowed to set therein and, whereby weighting material may be subsequently inserted into said interior chamber of said keel shell portion through said opening in said external wall of said keel shell portion.

4,691,464

AVIAN DECOY COVERING

Thomas E. Rudolph, David City, Nebr., assignor to Eidos Corporation, David City, Nebr.

Filed Jul. 25, 1986, Ser. No. 889,216
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **16 Claims**



1. A removable covering for a bird decoy, said covering comprising:

a flexible fabric having a size to substantially cover said decoy and having a shape to substantially conform to the shape of said decoy, said fabric having an exterior surface;

markings on said exterior surface to simulate the surface features of a bird corresponding to the decoy; and

a reflective panel mounted on the exterior of the fabric at a location substantially coincident with the location of secondary feathers on at least one side of said bird.

4,691,465

GAFF FOR LANDING FISH

Patrick D. Dooley, 1519 Simeonoff, Kodiak, Ak. 99615

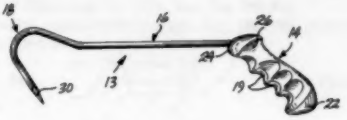
Filed Jun. 6, 1986, Ser. No. 871,475
Int. Cl.[4] A01K *97/14*
U.S. Cl. 43—5 **6 Claims**

1. A gaff for landing fish comprising

an elongated shank of predetermined cross-sectional width, said shank having a hook on one end thereof and a pistol grip handle on the other end thereof,

said hook having a first portion thereof which projects from the shank in one lateral direction thereof, and a second relatively outlying portion thereof which extends reentrantly about the one end of the shank from the first portion of the hook, in the opposing lateral direction of the shank,

said handle having a generally cylindrical body which is solid in outline, greater in cross-sectional width than the shank, and obtusely angled to the longitudinal axis of the shank in a plane substantially parallel to that longitudinal axial plane of the shank coinciding with the aforesaid lateral directions of the hook portions, so that when the user grips the handle in one hand, the body of the handle fills his hand and the user's forearm assumes a position substantially parallel to the longitudinal axis of the shank



while his hand is similarly but oppositely angled to said handle in a typical pistol grip position,

there being elongated indentations in the body of the handle on the inside edge portion thereof which curve about the circumference of the same so as to conform to the curvature of the fingers of the user's one hand when they are passed about the handle in his pistol grip thereon, and

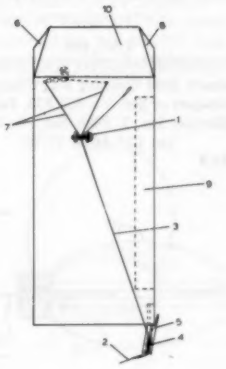
the body of the handle extending in the aforesaid opposing lateral direction of the shank, together with the relatively outlying portion of the hook, so that the user can cock and impale the fish without the hook at a point relatively in line with the length of his forearm.

4,691,466

CURRENT KILLER, SWIFT WATER FLOATER

Timothy K. Lamb, Rte. 1, Box 294, Red House, W. Va. 25168

Filed Apr. 23, 1986, Ser. No. 854,923
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—43.13 **3 Claims**



1. A swift water fishing device for maneuvering a fishing line to a desired location, comprising, a lightweight rectangular elongated body of bouyant material having a front bow, a trailing end and two side surfaces, said bow having three angled planar surfaces forwardly sloping toward one of said side surfaces, a lower one of said planer surfaces causing hydrodynomic lift on said body when disposed substantially perpendicular to the water surface in an up stream direction; a three point hitch yoke system for angularly disposing said body substantially perpendicularly to the water surface, one point of

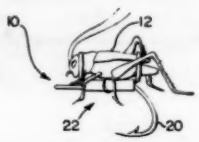
said three point hitch yoke system being a fixed anchor point on said trailing end of said body and having a tripable release for holding a hook end of the fishing line.

4,691,467

BAIT HOLDER AND METHOD FOR MAKING

Craig A. Brimmer, 2391-104th St. SE., Monroe, Wash. 98272

Filed Mar. 13, 1986, Ser. No. 840,408
Int. Cl.[4] A01K *83/06*
U.S. Cl. 43—44.4 **13 Claims**



1. A bait holder for fishing hooks of the type having a solid, elongated shank, comprising:

a continuous band of resilient material connected directly to the shank so as to form two resilient loops; and

a band retainer having a central portion tightly surrounding the band at the connection to prevent substantial axial movement of the band on the shank and having two axially extending wing portions loosely surrounding portions of the loops to hold the loops apart and to allow resilient axial movement of the loop portions and to prevent substantial radial movement of the loop portions.

8. A bait holder, comprising;

an elongated hollow tube;

a continuous band of resilient material connected directly to the hollow tube so as to form two resilient loops; and

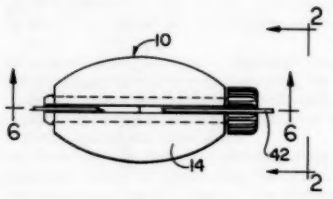
a band retainer having a central portion tightly surrounding the band at the connection to prevent substantial axial movement of the band on the hollow tube and two axially extending wing portions loosely surrounding portions of the loops to hold the loops apart and to allow resilient axial movement of the loop portions and to prevent substantial radial movement of the loop portions.

4,691,468

FISHING WEIGHT ASSEMBLY

James L. Fernbach, 2660 Wenning Rd., Cincinnati, Ohio 45231

Continuation-in-part of Ser. No. 828,853, Feb. 12, 1986. This application Jun. 2, 1986, Ser. No. 869,338
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.9 **2 Claims**



1. A fishing weight assembly which comprises an elongated body having spaced end panels, there being an elongated bore in the body, ends of the bore being in the end panels, there being a radial slot in the body extending outwardly from the bore through an outer face of the body, a plug member, the plug member including a stem frictionally received in the bore of the body and heads for bearing on the end panels, there being an elongated bore in the plug member extending lengthwise of the stem and the heads thereof and a radial slot extending from the bore through an outer surface thereof, an end portion of the stem being bifurcated, one of the heads including two parts, each of the parts being integral with one of the bifurcations, the bifurcated end portion of the stem and the two parts of said one of the heads being compressible to permit said one of the heads to advance along the elongated bore of the body, the radial slot of the plug member being alignable with the radial slot of the body, the bores of the body and of the stem receiving a line, the line being held in the bores when the plug member is rotated from aligned position.

4,691,469

FISHING TACKLE MANAGEMENT SYSTEM AND METHOD

Lawrence C. Alsobrook, 907 Terrace Acres Dr., and Norman F. Browning, 623 Forestdale Dr., both of Auburn, Ala. 36830

Filed Apr. 24, 1986, Ser. No. 855,470
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—54.1 **35 Claims**

1. A fishing tackle management system for storing and carrying fishing tackle comprising:

a plurality of individual soft fishing tackle pack units;

each soft tackle pack unit having a customized design and construction for storing and carrying prescribed fishing tackle;

each customized soft pack unit including:

an outer fabric layer providing a cover having a finished flat configuration,

a plurality of rows of transparent pocket systems arranged vertically spaced on an interior of said cover with a number of said pocket systems included in each row horizontally spaced across said cover,

each pocket system comprising a plurality of overlying transparent pockets customized for storing prescribed tackle, said pockets lying over one another in a superposed manner when said cover is laid out in said flat configuration,

said pockets having openings for placement and removal of fishing tackle; and

each pocket system comprising a flap with closure means for closing the openings for each transparent overlying pocket in said pocket system and each overlying pocket closing the opening of each underlying pocket; and

unit fastening means for securing said soft pack unit in a compact folded or rolled configuration with said fishing tackle stored therein.

4,691,470

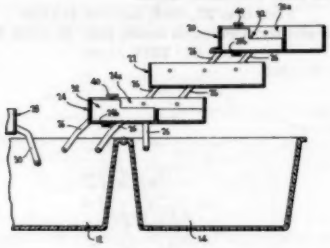
LIGHTED TACKLE BOX

Harper Landell, Downington, and Richard G. Woolworth, Lancaster, both of Pa., assignors to Woodstream Corporation, Lititz, Pa.

Filed May 12, 1986, Ser. No. 861,825
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 **14 Claims**

1. A portable lidded container having at least one internal

tray having a base wall with an opening therein, a battery-operated lighting fitting having a light bulb, and means locating the fitting on the tray with the bulb light located in said opening so as to light a part of the container below the tray when the bulb is activated, the fitting having a plunger-type switch projecting upwardly therefrom for depression by a member of the container above the tray when the container is closed so as to deactivate the bulb, and for release by said member when the container is opened so as to activate the



bulb, and said member of the container having switch actuating means for depressing and releasing the plunger switch as aforesaid, wherein the lighting fitting is a self-contained lighting fitting including a battery-receiving portion and circuitry for activating the light bulb, and locating means permits removal of the lighting fitting from the the tray for use of the lighting fitting separately as a flashlight, wherein the tray is compartmentalized, and the locating means comprises wall means defining a tray compartment, the lighting fitting being sized to fit in the compartment.

4,691,471

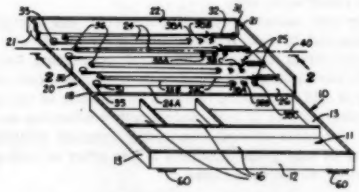
HOLDER FOR LEADERS

James E. Hansen, 16301 Valley Rd., Eden Prairie, Minn. 55344

Filed Dec. 30, 1986, Ser. No. 947,621

Int. Cl.[4] A01K *97/06*

U.S. Cl. 43—57.2 **18 Claims**



1. A kit for a holder of elongated lengths of line having opposite ends used in combination with a support panel that has a generally planar surface in at least one portion, said one portion having spaced opposite ends, the kit comprising:

a first retainer for mounting at a first of the opposite ends of a panel, and a second retainer for mounting at a second of the opposite ends of a panel, said retainers extending outwardly from such panel and having means for attaching opposite ends of an elongated length of line; and

a plurality of posts, including, a first post for mounting adjacent the second retainer and in position to substantially align with the first retainer, and being offset from the second retainer, and a second post for mounting adjacent the first retainer in position offset from the first retainer and the first post, whereby when the kit is assembled on a panel an elongated line can be attached with respect to one of the retainers, and then sequentially threaded around the first and second posts, the second end of such line being retained with respect to the second retainer.

4,691,472

PROCESS FOR REARING AND TRANSPORTING ARRANGEMENTS OF EPIPHYTIC PLANTS

György Makara, Budapest, Hungary, assignor to Innovator Mernok Kisszovetkezet, Budapest, Hungary

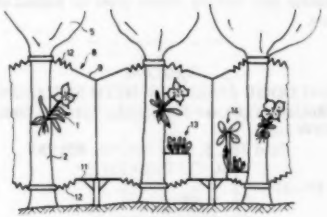
PCT No. PCT/HU84/00043, § 371 Date Apr. 24, 1985, § 102(e) Date Apr. 24, 1985, PCT Pub. No. WO85/00953, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 24, 1984, Ser. No. 740,842

Claims priority, application Hungary, Aug. 25, 1983, 3004/83; Feb. 8, 1984, 3004/83

Int. Cl.[4] A01G *9/00*

U.S. Cl. 47—58 **4 Claims**



1. A combination of a floral arrangement and a hot house, wherein said floral arrangement comprises precultivated epiphytes including orchids, hybrids, and intergeneric derivatives settled on the bark of a host tree such that said hot house surrounds said epiphytes, wherein an area of said tree is not surrounded by said hot house, said hot house surrounding the trunk of the tree in gripping relation such that at least the lower end of the trunk is outside the hot house.

4,691,473

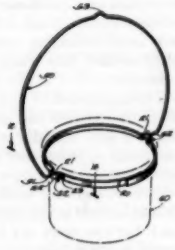
CIRCULAR PLANT MOBILE

Peter D. Ragen, 17055 W. Victor Rd., New Berlin, Wis. 53151

Continuation-in-part of Ser. No. 638,727, Aug. 6, 1984, abandoned. This application Mar. 4, 1985, Ser. No. 707,884

Int. Cl.[4] A01G *9/02*

U.S. Cl. 47—67 **16 Claims**



1. In a device for supporting hanging plant pots and the like consisting of a ring supporting a plant pot at the rim of the pot and a ring supporting hoop, the novelty comprising:

non-removable means pivoting the said ring from the said hoop including pivot holes in the ring, said hoop having two free ends each extending through a said pivot hole, cooperating locking means on said ring and said hoop comprising:

said free ends being shaped so that each said end engages

a complementary structure on said ring when said locking means is in its locked configuration;

complementary structures on said ring capable of engaging said free ends of said hoop to prevent relative rotation between said ring and said hoop, said free ends of said hoop being shaped so that each said free end may extend through a pivot hole in said ring,

said free ends being disengaged from said complementary structures on said ring when said locking means is in its unlocked configuration,

said locking means being able to secure said ring against pivotal motion with respect to said hoop except for storage,

said free ends each being positioned to substantially abut a pot placed in said ring, said free ends being movable radially inwardly of said ring to disengage said free ends from said complementary structures to unlock, whereby when said ring is filled with a pot, said free ends cannot be moved radially inwardly enough to release said locking means from its locked configuration.

4,691,474

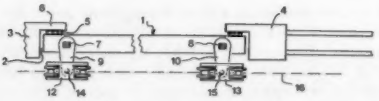
SLIDING DOOR ASSEMBLY WITH MULLION LOCK

Stanley Rokicki, 112 Lake Promenade, Toronto, Ontario, Canada M8W 1A4

Filed Jun. 5, 1986, Ser. No. 870,953

Int. Cl.[4] E05D *15/10*

U.S. Cl. 49—220 **8 Claims**



1. In a sliding patio door assembly, comprising a door, a slide track, and a door frame which includes a recess; and

where the arrangement is such that, when the door is in a first position, outside the recess, the door is free to slide along the slide track, and when the door is in a second closed position the door is entered into the recess; and where, in order to close the door, the door is moved bodily into the recess in a direction that is lateral or sideways relative to the slide track; said sliding door assembly having:

a pair of crank arms mounted on the door adjacent the sides thereof in a manner that each crank arm can pivot through an arc about a respective axis which is fixed relative to the door, said crank arms extending substantially at right angles to the plane of said door when the door is in said second, closed position;

where the initial pivoting action of the crank arms is not effective to give to the door its said lateral movement;

a door handle, which is intermedially positioned along the height of the door and adjacent one said side edge, and which is pivotable relative to the door;

a first latch bar, which is operative with the door handle;

a latch slot, which is so located in the jamb of the door frame that the first latch bar can enter the latch slot when the door is fully closed in the recess;

and a transmission connection between the door handle and the crank arms, positioned within said door in visually non-obstructing relation with the face of said patio door comprising a pair of crankshafts mounted vertically within the door adjacent the respective vertical edges thereof, and drive means located adjacent at least one horizontal edge of said door within the confines of said door interconnecting said crankshafts for rotation thereof in unison, the initial rotation of said door handle providing said initial pivoting action of said crank arms, and serving to move said first latch bar clear of said latch slot while said door remains in said second position, prior to effective rotation of said crank arms whereby the action of continuing turning the door handle is effective to cause the crank arms to rotate through an angular displacement effective to move the door from out the recess to said first position.

4,691,475

WINDOW REGULATOR

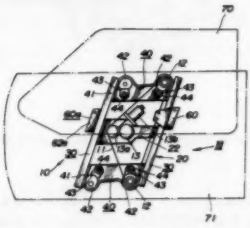
Junichi Maekawa, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Dec. 20, 1985, Ser. No. 811,858

Claims priority, application Japan, Dec. 20, 1984, 59-269307

Int. Cl.[4] E05F *11/48*

U.S. Cl. 49—352 **3 Claims**



1. A window regulator for raising and lowering a window pane of an automotive vehicle door, comprising:

a pair of guide rails;

a pair of connecting brackets contoured to have the same shape and symmetrically arranged to interconnect the end portions of said guid rails to form an integral framework, said connecting brackets having flanged peripheries extending in a direction tranverse to said guide rails;

a pair of reciprocating units which comprise roller units carrying thereon the window pane and movably mounted on said guide rails;

pair of guide members respectively mounted on said connecting brackets and a cable placed around said guide members and having opposite ends connected to one of said roller units; and

a drive unit mounted on said framework and operatively connected to said reciprocating units for driving said reciprocating units, wherein said connecting brackets each have two guide member mounting sections so that one of said connecting brackets mounts one of said guide members at one of said guide member mounting sections and the other of said connecting brackets mounts the other of said guide members at the other of said guide member mounting sections.

4,691,476

VEHICLE DOOR STRUCTURE

Hiroyuki Yao, Nagoya, and Yuji Okamoto, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 3, 1984, Ser. No. 677,297

Claims priority, application Japan, Dec. 19, 1983, 58-195292

Int. Cl.[4] B60J *1/17*

U.S. Cl. 49—374 **11 Claims**

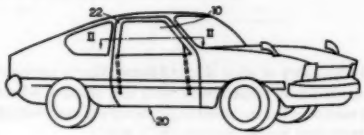
1. A vehicle door structure, comprising:

a door frame mounted onto a vehicle such that it opens and closes;

a door window having a plurality of corner portions, top and bottom edges, interior and exterior surfaces, and two substantially vertical edges, at least one of said plurality of corner portions being cut-off, the door window being provided in said door frame such that said exterior surface

of said door window is substantially flush with an exterior surface of said door frame; and

a slider fixed to one of said substantially vertical edges of said door window for guiding said door window along said door frame during an upward and downward displacement thereof, said slider including a substantially vertically extending base, a pair of substantially vertically extending extensions which project laterally from said base to define a gap therebetween, and a bridge extending from an upper end of said base for part of the distance between the substantially vertical edges of the door window and bridging upper ends of said pair of extensions, an upper surface of said bridge being substantially flush with



the upper end of said base and the top edge of said door window;

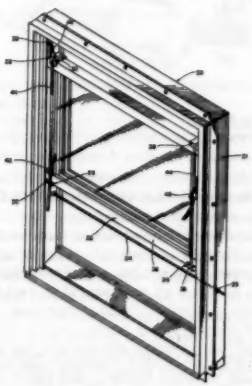
wherein said one substantially vertical edge of said door window is positioned within said gap between said pair of extensions, base and bridge, said bridge and said pair of extensions cooperate to surround said at least one cut-off portion of said plurality of corner portions of the door window, and a recess between said slider and said one substantially vertical edge of said door window within said gap is filled with an adhesive, whereby said adhesive is prevented by said bridge and said pair of extensions from contacting the upper surface of said bridge, the upper end of said base, and the top edge of said door window.

4,691,477

RIGIDIFYING SYSTEM FOR WINDOW ASSEMBLY DURING ITS SHIPMENT AND INSTALLATION

Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.

Filed Jul. 28, 1986, Ser. No. 889,762
Int. Cl.[4] E06B *3/32*
U.S. Cl. 49—380 **9 Claims**



1. A rigidifying system for a sliding sash window assembly comprising:

a tensioning element removably connected between vertical sides of a frame of the assembly to prevent outward bowing of said vertical sides,

holding means for one sliding sash of the window assembly including clip elements secured to the top corner regions of such sash,

means releasably anchoring said clip elements to said vertical sides of said frame,

said holding means further comprising tensioning straps encircling said one sliding sash vertically and engaging and holding said clip elements, and

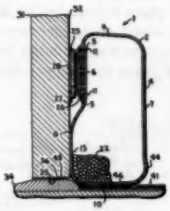
additional clip elements on the bottom of said one sliding sash and being engaged and held by said tensioning straps.

4,691,478

INFILTRATION CONTROL DEVICE

John W. Lorg, 1235 A Woodchase La., Chesterfield, Mo. 63017

Filed Sep. 25, 1986, Ser. No. 911,513
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—499 **16 Claims**



1. An infiltration control device for doors, operable windows and the like which comprises:

(a) an elongated tube, which includes:

(1) inner and outer sides;

(2) upper and lower edges;

(3) a fabric strip with opposite, overlapping side margins at said inner side;

(4) said strip being secured to itself at a lap seam adjacent to said side margins;

(5) opposite closed ends; and

(6) an enclosed pocket;

(b) insulation materials substantially filling said pocket; and

(c) longitudinally-extending fastener means secured to said tube over said seam thereof and adapted for mounting said device on a door, operable window or the like.

4,691,479

MACHINE AND PROCESS FOR CUTTING CHIPPING-GROOVES INTO ELONGATED PERIPHERAL MILLING CUTTERS WITH HEMISPHERICAL TIPS

Hans-Joachim Helle, Tübingen, Fed. Rep. of Germany, assignor to Montanwerke Walter GmbH, Tübingen, Fed. Rep. of Germany

Filed May 19, 1986, Ser. No. 865,043
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520521
Int. Cl.[4] B24B *3/02*
U.S. Cl. 51—165.71 **13 Claims**

1. Machine for cutting a cutting end and chipping-grooves, particularly into workpieces (18) forming elongated peripheral cutting tools such as milling cutters, die cutters, and the like, having a shank portion (9) and a cutting end which defines an essentially hemispherical end portion (29)

comprising

a cutting machine (1) having a machine bed (3);

a clamping device (6) for clamping the shank portion (9) of the workpiece, mounted on the machine bed;

a rotatably driven cutting device (12);

a rotatably driven disk-shaped cutting tool (15) on the cutting device;

a plurality of actuators (5,11,13) coupled, respectively, to the cutting tool (15) and the clamping device (6) for relative movement, adjustable in a coordinate system related to the workpiece (8),

wherein the coordinate system is defined by

an X-axis which contains the longitudinal axis of the workpiece (8),

a Y-axis which extends orthogonally to the X-axis, and

a Z-axis which extends at right angles to the X and Y-axes;

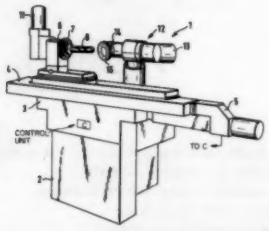
and a control unit (C) coupled to and controlling the movement of the actuators,

wherein, in accordance with the invention,

the control unit controls relative movement of the cutting tool (15) and of the clamping device (6) and hence the workpiece (8) by controlling the respective actuators (5, 11),

said cutting tool being moved by the respective actuator (13) in a direction parallel to a W-axis,

wherein said W-axis is determined by an axis which intersects an X-Y plane defined by the X-axis and the Y-axis at an angle (ϕ), which angle represents the pivoting angle of the cutting tool, and wherein the projection of the W-axis unto the X-Y plane extends parallel to the X-axis;



said control unit further controlling said relative movement of said actuators, continuously and without interruption, to move an intersection (31) of the axis of rotation of the cutting tool with the X-Y plane to describe, approximately, a part circle (23) having the concave sides thereof facing the hemispherical end portion (29) of the workpiece (8),

said part circle (23) beginning at a transition plane which intersects the X-Y plane at right angles, and defines a Y-Z plane, and positioned at the transition between the shank portion (9) and the essentially hemispherical end portion (29) of the workpiece; and

wherein said control unit further controls, simultaneously, movement, during passage of the cutting tool through said part circle (23), feed of the cutting tool parallel to the W-axis and towards the longitudinal axis of the workpiece (8), so that a finished cutting edge (21) on the workpiece (8) will smoothly continue between the transition plane (Y-Z) and the end portion of said workpiece.

to provide a positive rake of the cutting edge in the direction of the longitudinal axis starting from the transitional plane towards the hemispherical portion (29) of the chipping groove cut by said cutting tool.

4,691,480

VALVE SEAT GRINDING APPARATUS

John R. Kelsey, 424 Wessex Rd., Valparaiso, Ind. 46386

Continuation-in-part of Ser. No. 650,841, Sep. 17, 1984, Pat. No. 4,610,112. This application Jan. 16, 1986, Ser. No. 819,281

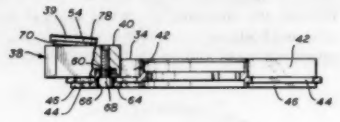
Int. Cl.[4] B24B *15/02*

U.S. Cl. 51—241 A **10 Claims**

1. Valve seat grinding apparatus comprising:

(a) a rotatable drive wheel of disk shape having central means for connection to be driven by rotary drive means;

(b) a plurality of independently rotatable satellite wheels carried about said drive wheel with the respective radial planes of said satellite wheels being disposed at a selected included angle with respect to the axis of said drive wheel and disposed at a selected radial distance away from said axis of said drive wheel;



(c) a plurality of slide blocks intermediately connecting said drive wheel respectively with said satellite wheels;

(d) said selected included angle being selected within a range including ninety degrees (90°); and

(e) said drive wheel being made of shape, of material and of thickness to resist any deflection which would change said selected included angle by forces applied through said drive wheel to said satellite wheels within the operational range of forces employed with said apparatus;

4,691,481

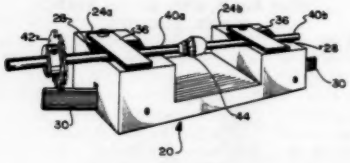
DOPSTICK TRANSFER JIG DEVICE AND METHOD FOR USING SAME

Julius Souch, 1642 E. 33rd St., Lorain, Ohio 44055

Filed May 15, 1986, Ser. No. 863,365

Int. Cl.[4] B23Q *7/00*

U.S. Cl. 51—277 **4 Claims**



1. A jig device for transferring a partially faceted gemstone from one dopstick to another dopstick so as to permit spatial relativity of the gemstone surfaces to the indexing head of the mechanical faceting device, and therefore to the facet cutting surface, to be maintained comprising:

two grooved blocks in association with each other;

means for clamping a dopstick in each of said grooves, and

two swivelable pawls, wherein said grooved blocks are attached to a base piece and separated from each other by a space large enough to accommodate the gemstones to be faceted; and wherein the groove in each of said blocks is in horizontal and vertical alignment with the groove in the other, and wherein further, said pawls are mounted in slots substantially directly below and parallel to said grooves, and are held by, and swivelable on pins located in said blocks, one end of each of said pawls being adapted to swivel upward toward an imaginary line extending in line with said grooves, and away from said jig device.

4,691,482

ROOF CONSTRUCTION

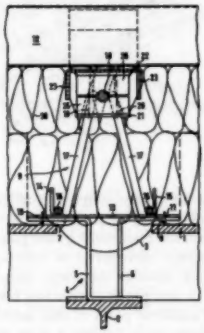
Horst D. Heinemann, Wolfsweg 10, D-5241 Gebhardshain, Fed. Rep. of Germany, and Alfred Jost, Wilnsdorf-Niederdilfen, Fed. Rep. of Germany, assignors to Horst D. Heinemann, Gebhardshain, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,658

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3343984; Jun. 13, 1984, 3421871

Int. Cl.[4] E04D *12/00, 13/16;* **E04C** *1/78*

U.S. Cl. 52—3 **13 Claims**



1. In a roof construction for converting a ventilated roof into a thermally insulted, nonventilating roof without removing an existing roof sheathing which is carried by roof beams, the improvement comprising said existing sheathing having holes therethrough over the length of each roof beam at approximately equal intervals, wherein posts are secured on the roof beams, extend through the holes and project above the existing roof sheathing, wherein an intermediate carrier is secured on the posts, wherein said carrier supports a profile and extends above the posts which are arranged in a row, wherein the intermediate carrier includes insulating means for substantially preventing a flow of thermal energy between the posts and the profile through the intermediate carrier, wherein new roof sheathing is secured on the profile, wherein the carrier, the profile and the new sheathing are substantially completely supported by the posts, and wherein a space between the existing sheathing and the new sheathing is filled with an insulating layer.

4,691,483

SHELTER

Thomas L. Anderson, Nashua, N.H., assignor to Craig Systems Corporation, Amesbury, Mass.

Filed Dec. 31, 1984, Ser. No. 688,017

Int. Cl.[4] E04H *9/00;* **H05K** *9/00*

U.S. Cl. 52—79.1 **6 Claims**

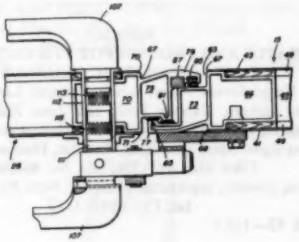
1. A lightweight shelter for protecting electronic equipment from normal and abnormal environmental conditions including severe electromagnetic pulses, said shelter comprising:

wall panels and roof and floor panels each comprising inner and outer aluminum skin sheets with an insulating spacing material adhesively bonded therebetween;

along each line of intersection of a pair of side panels, an extruded aluminum tube of rectangular cross-section, the outer skins of the adjacent panels being extended substantially beyond the spacing material and being welded to each other and said tube thereby to form a substantially continuous conductive outer skin for said shelter;

in one side panel, a rectangular door opening frame comprising, along all four sides, an extrusion over which said inner and outr skins extend and to which said skins are welded;

hinged to said frame, a door comprising a door panel comprising inner and outer aluminum skins with an insulating spacer material adhesively bonded therebetween and a peripheral frame comprising, along all four sides, an extrusion over which the inner and outer skins of said door panel extend and to which said skins are welded, wherein said door opening extrusion and said door panel extrusion each include a box section which extend into a projecting lip portion, such that said door opening projecting lip portion is positioned relative to said door panel box section when said door is received into said frame, wherein said door opening projecting lip portion carries at least one peripherally mounted spring metal finger strip and said door panel box section carries at least one peripherally mounted spring metal finger strip which together provide at least two lines of conductive gasketing between said door opening frame and said door peripheral frame, when said door is received into said frame;



at least one weather gasket carried along the periphery of said door panel projecting lip portion which protects said at least one door opening projecting lip metal finger strip and said at least one door panel box section metal finger strip from ambient weather conditions when said door is received in said frame;

mounted at a plurality of spaced points around said door opening frame, a succession of locking ramps;

pivotally mounted at a plurality of spaced points around said door peripheral frame, a corresponding plurality of dogs adapted to engage said ramps; and

link means coupling said dogs to each other in sets for coordinated operation to engage said ramps and pull said door into intimate conductive engagement with said door opening frame, compressing said spring finger strips.

4,691,484

EXPANDABLE DECK SYSTEM

James W. Wilson, Rte. 2, Box 750, Big Sandy, Tenn. 38221

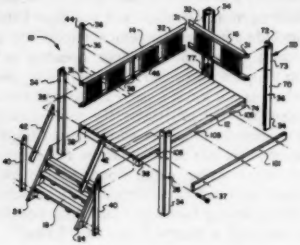
Filed Mar. 14, 1986, Ser. No. 839,600

Int. Cl.[4] E04F *11/10;* **E04B** *1/343*

U.S. Cl. 52—79.6 **17 Claims**

1. An improved deck system of the type in a wooden platform is constructed with side panels at least partially thereareound and steps providing access thereto, wherein the improvement comprises a portable deck structure including a fixedly assembled platform, fixedly assembled longitudinal side panel, fixedly assembled end panel, fixedly assembled step section and plurality of structural members adapted for securing said platform, steps, side and end panels one to the other and to a supporting surface, said longitudinal side panel further being constructed in the form of a structural truss and including a center attachment beam for coupling an intermediate section of said platform to said side panel, and said side panels being adapted for interchangeability on opposite sides and ends

of said platform, said step section being adapted for securement to either end of said platform, and said platform being adapted



for attachment to a second platform positioned on end or side thereof facilitating bi-directional expansion of said deck.

4,691,485

APPARATUS AND PROCESS FOR THE CONSTRUCTION OF MONOLITHIC CEILINGS

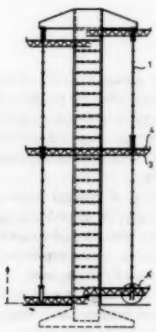
István Nagy; Ferenc Nagy; István Pozsgai; László Karátson; Andor Gábori; Kálmán Tóth, and Jeno Zubretzky, all of Budapest, Hungary, assignors to Epitestudomanyi Intezet & Konnyuipari Szerelo es Epito Vallalat, Hungary

Filed May 29, 1986, Ser. No. 868,802

Claims priority, application Hungary, Nov. 30, 1982, 3838/82

Int. Cl.[4] E04B *1/35*

U.S. Cl. 52—125.1 **12 Claims**



1. Apparatus for the construction of monolithic ceilings, particularly for monolithic ceilings of multi-level or pillar-framed buildings having suspended ceilings, said apparatus is provided with surface- and in given case working level- forming formwork shell surrounding the monolithic concrete formspace of the ceiling formwork bearer supporting the formwork shell, furthermore actuating mechanisms, e.g., lifting units for lifting and lowering the formwork bearer, the actuating mechanisms, e.g., lifting units are in force-transmitting connection directly or indirectly with a certain part, e.g., pillars of the temporary or permanent vertical load bearing structures of the building, load bearing elements, e.g., bear frame, connecting member, etc., are built in between the formwork bearer and the lifting units, characterized in that the lifting units **/7/** are interconnected preferably with storey- high intermediate members **/8/** forming forced trajectory for the formwork bearer **/3/**, furthermore the intermediate members **/8/** are provided with releasable hinged bearers **/9/** fixed to the vertical load bearing structure **/1/** temporarily holding and temporarily releasing the intermediate members **/8/** whereby to allow an inching movement of the lifting units **/7/**.

4,691,486

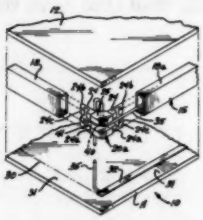
GLASS ASSEMBLY FOR REFRIGERATOR DOORS AND METHOD OF MANUFACTURE

Frank Niekrasz, 18009 Loomis Ave., Homewood, Ill. 60430, and Andrew Menke, 8600 W. 145th Pl., Orland Park, Ill. 60462

Filed Apr. 29, 1982, Ser. No. 372,993

Int. Cl.[4] E06B *7/12*; F16B *12/46*; A47F *3/04*; H05B *3/08*

U.S. Cl. 52—172 **9 Claims**



1. A glass assembly comprising a pair of similarly sized glass panes disposed in side-by-side relation, a spacer interposed between said panes for maintaining said panes in parallel relation with an airspace therebetween, said spacer including a plurality of hollow tubular members disposed adjacent the peripheral edges of said panes corner key elements connecting together ends of adjacent pairs of said tubular members, said corner key element each having a pair of perpendicularly disposed interconnected legs, said legs each being adapted for mounting into an end of a respective tubular spacer member, at least some of said corner key elements being formed with a first electrical lead wire passage means extending about the periphery of the corner key element communicating between the ends of two tubular members connected to said corner key element for permitting electrical lead wires to be trained about said corner key element from the end of one of the tubular members connected thereto and into the end of another tubular member connected thereto, and said some corner key elements being further formed with second electrical lead wire passage means communicating between said air space and said first passage means for permitting an electric lead wire within said air space to be directed through said second and first passage means of the corner key element and into either tubular member connected thereto, one of said panes having a conductive surface on a side thereof adjacent said airspace, a plurality of lead wires electrically coupled to said conductive surface, said lead wires coupled to said conductive surface being trained through the passage means of some of said corner key elements and longitudinally through some of said tubular members to an egress opening therein, said lead wires extending out of said egress opening to a location outside the periphery of said tubular members and glass panes, and means sealing the periphery of said assembly with said lead wires extending outwardly therefrom.

4,691,487

DRAIN TUBE FOR WINDOWS

Gerald Kessler, 302 McClurg Rd. at Southern Blvd., Box 389, Youngstown, Ohio 44501

Filed Jul. 31, 1986, Ser. No. 891,346

Int. Cl.[4] E06B *7/14*

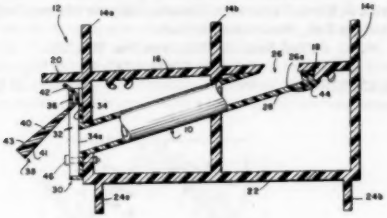
U.S. Cl. 52—209 **11 Claims**

1. A window assembly, comprising

an extruded frame serving as a window sill and having at least one vertically extending wall defining the exterior of said sill, and at least one generally horizontal wall for defining the upper surface of the sill for contact with a movable window;

a straight drain tube having an inlet end and an outlet end, said outlet end having a closure face integrally formed therewith;

a flap-like closure removably and pivotably secured to said closure face of said drain tube, said flap-like closure including a horizontal leg and a substantially longer vertical leg, said vertical leg having a tapered cross-section whereby said vertical leg becomes progressively thicker in cross-section as it approaches its end farthest from said horizontal leg, said vertical leg including a concave depression in its exterior face;



said drain tube being positionally mounted in said extruded frame at an angle from the horizontal with its inlet end being generally flush with a hole in said generally horizontal wall, said drain tube extending through an opening in said vertically extending wall and with said closure face being mounted to the exterior face of said vertically extending wall at a lower level than said inlet end.

4,691,488

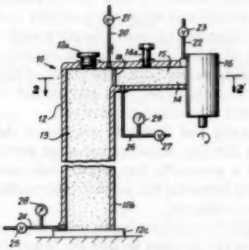
METHOD FOR PRODUCING A CONCRETE-FILLED STEEL BODY FOR SUPPRESSING VIBRATIONS

Kauko Tomma, Helsinki, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Continuation-in-part of Ser. No. 291,928, Aug. 11, 1981, abandoned, which is a continuation of Ser. No. 33,219, Apr. 25, 1979, abandoned, which is a continuation of Ser. No. 648,744, Jan. 12, 1976, abandoned, which is a continuation of Ser. No. 514,320, Oct. 11, 1974, abandoned. This application Oct. 31, 1984, Ser. No. 666,967

Int. Cl.[4] **E04C** *3/10;* **B65H** *16/02, 18/00;* **B28B** *9/04*

U.S. Cl. 52—223 R **10 Claims**



8. A constructional element comprising a concrete-filled steel frame including a rotary unit for a machine having rotating paper web forwarding means, said element having good load carrying and vibration absorbing properties, comprising:

a combination of steel and concrete combined as load carrying materials, the main steel parts of said element forming a pressurizable hollow box-like steel casing, said casing being initially filled with a fluid concrete mass; supplying an internal pressure from an external source on said concrete mass during its hardening phase, said pressure being at least about 30% of but not exceeding the elastic limit of the casing, so as to positively expand said steel casing and provide therein an elastic expansion exceeding the sum of the shrinkage of said concrete mass during its hardening phase and any deformation occurring due to any normal load from said machine, said casing forming the main prestressing element of said constructional element, said casing being elastically expanded by the concrete for maintaining a firm contact between said casing and said concrete when substantial external loads are applied to said element, said concrete supporting said steel casing and damping vibrations induced in said steel casing.

4,691,489

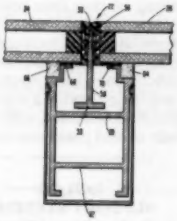
JOINT SEAL ASSEMBLY

John R. Shea, Jr., 6404 Murray Hill Rd., Baltimore, Md. 21212

Filed Feb. 11, 1986, Ser. No. 828,333

Int. Cl.[4] **E04H** *1/00*

U.S. Cl. 52—235 **18 Claims**



1. An architectural panel assembly having a pair of adjacent panels with spaced opposing edge surfaces of substantially equal width, each panel having opposite first and second surfaces, comprising:

a flexible and compressible sealing means configured to seal the space between the opposing edge surfaces of the two adjacent panels when the panels are in place, said sealing means having a horizontal cross section with a crown and two spaced legs, said two spaced legs each having an end opposite said crown, said crown defining an end of said sealing member opposite said leg ends, said two spaced legs forming a slotted cavity therebetween having an elongated opening opposite said crown, said opening extending the vertical length of said sealing means, the ends of said two spaced legs being flanged outwardly away from said opening, each of said flanged portions having an inner flange surface facing the crown end for abutting the first surface of one of said adjacent panels, the sealing means having a dimension measured from each of said inner flange surfaces to said crown corresponding to the width of said adjacent panels to be sealed, for limiting the crown of the sealing member to a position flush with the second surface of each of the adjacent panels, no portion of said sealing means extending beyond the second surface of the adjacent panels;

a rigid member configured to fit in the cavity portion of said sealing means to maintain said sealing means in alignment with the opposing edge surface of said adjacent panels for positioning the crown flush with said second surface of each of the adjacent panels for the entire length of the rigid member, whereby said sealing means and said rigid member are configured for complete sealing installation from the first surface side of said adjacent panels.

4,691,490

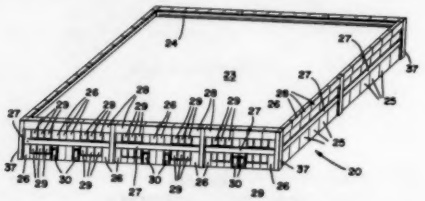
CEMENTITIOUS MODULAR PANEL AND PANEL ASSEMBLY FOR BUILDING WALLS AND METHOD OF CONSTRUCTION

James M. Leaver, 4145 Canyon Rd., Lafayette, Calif. 94549

Continuation of Ser. No. 419,746, Sep. 20, 1982, abandoned. This application Jan. 31, 1986, Ser. No. 825,080

Int. Cl.[4] E04B *2/00*

U.S. Cl. 52—293 **17 Claims**



1. An improved flanged cementitious and glass fiber reinforced building panel unit for assembly into a self-supporting unit by bolting through a flange of said panel comprising a generally rectangular panel structure with a thickness of at least ¾ inch consisting of glass fiber reinforced concrete containing from four (4) to six (6) percent glass fiber by weight, at least fifty (50) percent of cement by weight and aggregate said aggregate consisting of diatomaceous earth and Vermiculite, said panel structure having at least one integral flange along one of its edges, said flange having a thickness at least equal to the panel structure thickness, and said flange angularly disposed to the surface of said panel structure.

4,691,491

SUPPORT SYSTEMS

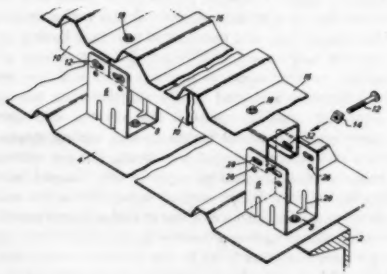
Raymond A. Lilley, Jordans, United Kingdom, assignor to Cladcolor Profiling Limited, Newport, United Kingdom

Filed Mar. 19, 1986, Ser. No. 841,285

Claims priority, application United Kingdom, Mar. 20, 1985, 8507191

Int. Cl.[4] E04B *5/52*

U.S. Cl. 52—481 **7 Claims**



1. A support system comprising:

a pair of U-shaped brackets arranged to be mounted in alignment with each other, and each having rail locating means;

a spanning rail of inverted U-shaped cross-section each of said pair of brackets and said rail being nested one within the other with the rail resting on the locating means of each bracket; and

an inverted U-shaped clamp member for each bracket, each said clamp member being arranged to straddle said rail and to be secured to a corresponding bracket to provide a rigid composite structure of generally rectangular configuration and each said clamp member defining a profiled recess arranged to engage said locating means and by cam action effecting displacement of the clamp member with respect to the bracket to bring the clamp member into a predetermined position with respect to said bracket.

4,691,492

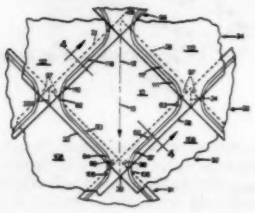
INTERLOCKING ROOF TILE

Patrick J. Kane, Vancouver, Canada, assignor to Creative Metal Designs Ltd., Vancouver, Canada

Filed Mar. 7, 1985, Ser. No. 709,208

Int. Cl.[4] E04D *1/00*

U.S. Cl. 52—519 **23 Claims**



1. A tile adapted to cooperate with similar tiles to form a tiled surface, the tile being a relatively thin sheet and having:

(a) a periphery having first and second side edges intersecting at upper and lower corners and being disposed symmetrically about a central axis extending between the corners so that, when the tile is installed, the central axis coincides essentially with a line defining free water flow down the tile between upper and lower tile portions, the side edges being mirror images of each other about the central axis,

(b) first and second raised ribs extending symmetrically as mirror images of each other on each side of central axis, each rib having upper and lower rib portions which are substantially similar in cross-section to each other and are interconnected so as to extend smoothly and continuously between the upper and lower tile portions to increase stiffness of the tile, the upper and lower rib portions having rib axes which are also mirror images of each other about a lateral axis disposed normally to the central axis, the ribs intersecting the respective side edges generally adjacent to the upper and lower corners to provide first and second intermediate edge portions extending between the intersections of the first and second ribs with the first and second side edges respectively,

(c) a generally flat first side margin of the tile extending between the first intermediate edge portion and the first rib, and a generally flat second side margin of the tile extending between the second intermediate edge portion and the second rib,

(d) the upper rib portions being generally complementary to the lower rib portions so that the lower rib portions of an upper tile can fit over the upper rib portions of a lower tile.

4,691,493

THIN PLATE STRUCTURE

Anders Larsen, Hasley, Denmark, assignor to Nord-Plan Stalreoler A/S, Vipperod, Denmark

Filed Nov. 1, 1985, Ser. No. 794,191

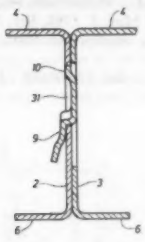
Claims priority, application Denmark, Nov. 15, 1984, 5436/84

Int. Cl.[4] E04C *1/30, 2/42, 3/04*

U.S. Cl. 52—588 **13 Claims**

1. A thin plate structure such as a deck structure for instance for a footbridge and comprising at least two abutting, substantially horizontally placed profiled girders, each girder com-

prising at least two substantially vertical, spaced, plate-shaped side members, the girders including a plurality of connecting means in the side members, characterized in that the connecting means are locking means comprising at least one downwardly pointing locking tongue integral with an associated one of the side members of each girder, said locking tongue extending outward in an offset manner along a bending area and downward therefrom, and furthermore co-operating with a locking tongue opening punched out opposite the locking tongue in an abutting side member of an adjacent girder, and in that the locking means comprises at least one upward locking gill cut out in one of the side members of each girder, said locking gill extending outward and upward in an offset manner along a generally horizontally extending bending area and furthermore co-operating with a locking gill opening punched



out opposite the locking gill in the abutting side member of the adjacent girder, and that the side members furthermore are so resilient that they allow an insertion of the locking tongue and the locking gill into the locking tongue opening and the locking gill opening, respectively, the locking gill having an upper edge surface defining an upwardly-facing rim surface, and the locking gill opening having an opposed, downwardly-facing surface which abuts said rim surface of said locking gill, the bending area of the locking tongue having a downward side and the locking tongue opening have an upward rim surface which abuts said downward side, the locking tongue having an inner side which has an uppermost area, the abutting side member having an inner side abutting said uppermost area, said tongue and gill being spaced vertically and separated by a planar area of the side member.

4,691,494

METAL FRAMING SYSTEM

Jacob M. Gwynne, 1853 Woodhaven Cir., Sarasota, Fla. 33562

Filed Jun. 28, 1985, Ser. No. 749,731

Int. Cl.[4] E04C *3/30*

U.S. Cl. 52—729 **29 Claims**

1. A framing member continuously roll formed from a sheet of material of substantially constant thickness and having an inner and an outer surface comprising:

a generally planar web;

a pair of spaced apart, generally parallel and planar flanges each disposed from a different edge of said web and extending generally at right angles to the plane of said web, so as to form with said web a channel-shaped member with three sides of a generally rectangular cross-section with said outer surfaces, smooth and each lying in a plane;

each of said flanges having inwardly disposed along each distal edge, continuously roll formed curved side walls defining multi-purpose fastening recesses;

said side walls of said recesses having a curved configuration extending through more than 180 degrees;

said recesses terminating in a straight line segment recurved in relation to said curved configuration; and

said straight line segment of said recesses ends in the plane of said flange.

4,691,495

PRODUCT RETARD DEVICE FOR DROP-LOADING PACKAGING MACHINE

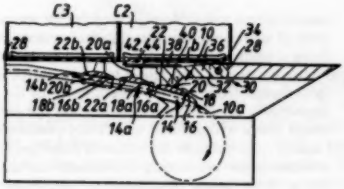
Rudolf Schuh, Schweich, Fed. Rep. of Germany, assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 18, 1986, Ser. No. 886,713

Claims priority, application United Kingdom, Jul. 20, 1985, 8518360

Int. Cl.[4] B65B *21/02, 5/06*

U.S. Cl. 53—48 **5 Claims**



1. In a machine for conveying empty open-top article carriers along a feed platform to a loading station and drop-loading articles such as bottles or the like into the article carriers at said loading station, a device for intercepting the fall of the articles after they have entered the article carriers, said device comprising support means arranged at the loading station to temporarily displace the base panel of the article carriers upwardly and provide an elevated platform to which the dead load of the articles is transmitted when the articles are dropped into the article carriers, actuating means for causing said support means to be displaced upwardly and thereafter withdrawn whereby the dead load of said articles is transferred from said support means to the base panel of said article carriers, said support means comprising a pivotal arm disposed below the path of movement of said article carriers, and said feed platform being constructed so as to permit said pivotal arm to engage the base panel of said article carriers, characterized in that said actuating means includes an endless series of cam plates arranged to move below said pivotal arm and a cam follower associated with said pivotal arm so as to cooperate with said cam plates.

4,691,496

FILLER LINE MONITORING SYSTEM

F. Allan Anderson, San Francisco; Henry C. J. Chen, Fremont; Vito A. DiMucci, Saratoga, and Roger C. Wang, San Jose, all of Calif., assignors to Peco Controls Corporation, Milpitas, Calif.

Filed Jan. 31, 1983, Ser. No. 462,640

Int. Cl.[4] B65B *57/00*

U.S. Cl. 53—53 **20 Claims**

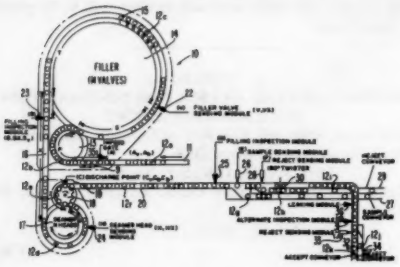
1. A monitoring and control system for a fluid container filler line having an empty container in-feed conveyor, a multi-valve rotary fill station, a multi-head seamer station to close and seal the then filled containers, a discharge conveyor and a fill height detector for under and overfill detection of liquid

within said containers, said monitoring and control system comprising:

(a) first sensor means located for indicating a first valve of a sequence of numbered fill valves in said fill station, a valve counter, and means for resetting said valve counter to 1 each time increment that said first valve passes said first sensor means;

(b) second sensor means located for counting each valve of the sequence to fill valves; a signal from said second sensor means for advancing said valve counter;

(c) controller means responsive to said first and second



sensor means and said valve counter for spacially tracking each of said containers through said system and for identifying a particular fill valve for each particular container;

(d) detector means responsive to said controller means and fault signals from said fill height detector for detecting an improperly filled faulty container and the particular numbered valve which filled said faulty container; and

(e) means responsive to detection of improperly filled faulty containers for preventing a container on said infeed conveyor from being positioned in said filter station at a numbered valve of said fill station which has been detected as being faulty.

4,691,497

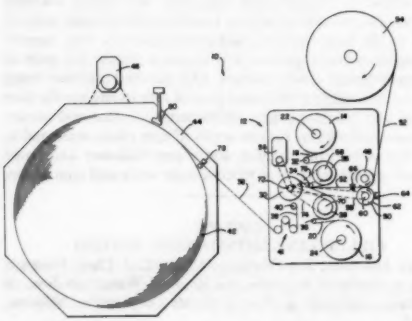
FILM LAMINATION STRETCH WRAPPING

William G. Lancaster, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Mar. 28, 1986, Ser. No. 845,556

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—399 **36 Claims**



1. An apparatus for assembling and dispensing a multi-ply web and wrapping a load with the multi-ply web comprising:

a film web dispenser including first and second upstream roller means which are spaced from each other, each for receiving at least one of a plurality of webs provided by at least two rolls of web material, downstream roller means for receiving the plurality of webs from the upstream roller means and for dispensing the film web as a multi-ply film web, and means for prestretching at least one of the webs between the upstream and downstream roller means;

means for rotating the load relative to the film web dispenser to wrap the multi-ply web on the load;

means for maintaining tension on the multi-ply web between the dispenser and the load; and

means for inserting a core material between the plurality of webs upstream of the downstream roller means and downstream of the first and second upstream roller means.

4,691,498

PROCESS AND MACHINE FOR HOOPING A PACKAGE WITH A HOOPING BAND

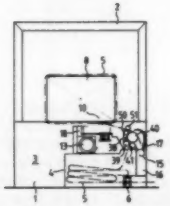
Nikolaus Stamm, Kilchberg, Switzerland, assignor to A. Konrad Feinmechanik AG., Mehrenschwand, Switzerland

Filed Mar. 3, 1986, Ser. No. 834,401

Claims priority, application Switzerland, Mar. 15, 1985, 1180/85

Int. Cl.[4] B65B *13/22*

U.S. Cl. 53—399 **8 Claims**



1. A process for hooping a package with a hooping band comprises: providing a first and second band supply means and a joining station, feeding a band from said first band supply means to said joining station such that said band envelopes a package to the hooped, sensing when said band arrives at said joining station, retracting said band by said first band supply means at a first speed and said second band supply means at a second speed upon sensing the arrival between said first and second band supply means of said band at said joining station so as to create a reserve band loop while loosely engaging said band around said package, sensing when said band is loosely engaged, further retracting said band by said first band supply means at a second speed lower than said first speed so as to use up said reserve band loop while tensioning said band around said package, sensing when said band is tensioned, joining said band in said joining station and separating the joined band from said joining station.

4,691,499

METHOD OF TENSIONING A WEB OF PACKAGING MATERIAL

Yoshiaki Umeda; Ryouhei Matsumoto; Hiroyasu Isomura, and Hisakuni Shimotaka, all of Aichi, Japan, assignors to Fuji Machinery Company, Ltd., Aichi, Japan

Filed Oct. 31, 1984, Ser. No. 666,676

Claims priority, application Japan, Apr. 16, 1984, 59-77010; Apr. 16, 1984, 59-77013

Int. Cl.[4] B65B *9/06, 41/12, 41/16*

U.S. Cl. 53—451 **20 Claims**

1. A method of tensioning a web of packaging material in a form-fill-seal packaging system, wherein the web of packaging material is pulled from a supply roll by means of web feeding rolls, and guided over means for forming the web or packaging material into tubing for enveloping articles to be packaged within the packaging material and for forwarding the formed enveloping tubing toward a sealing means for forming sealed

packages, between the web feeding rolls and the tube forming means, comprising the steps of:

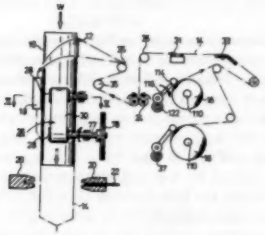
providing a single source of driving power for both said web feeding rolls and said tube forming means;

providing a first transmission means upon a shaft, between said single source of driving power and said web feeding rolls, and between said single source of driving power and said tube forming means, for driving said web feeding rolls and said tube forming means at a low rate of speed;

providing a second transmission means upon said shaft, between said single source of driving power and said web feeding rolls, and between said single source of driving power and said tube forming means, for driving said web feeding rolls and said tube forming means at a high rate of speed;

providing a one-way transmission means between both said first and second transmission means and said tube forming means;

actuating said first transmission means while deactuating said second transmission means so as to drive said web feeding rolls and said tube forming means at said low rate of speed so as to initially tension said web of material;



actuating said second transmission means while deactuating said first transmission means so as to drive said web feeding rolls and said tube forming means at said high rate of speed for conveying a predetermined amount of said web or packaging material at a high rate of production speed in preparation for formation of an enveloping package within which one of said article is to be enveloped;

actuating said first transmission means while deactuating said second transmission means so as to drive said web feeding rolls and said tube forming means at said low rate of speed in preparation for stopping of said web feeding rolls and said tube forming means whereupon sealing of said package can occur; and

deactuating said first transmission means while maintaining said second transmission means deactuated, and stopping said web feeding rolls and said transmission shaft, so as to stop driving power from being transmitted to said web feeding rolls and said tube forming means yet permitting said one-way transmission means to continue to rotate said tube forming means for a limited time after said stoppage of said web feeding rolls so as to retain said tension upon said web of packaging material within said stopped mode.

4,691,500

LID SEALING MACHINE

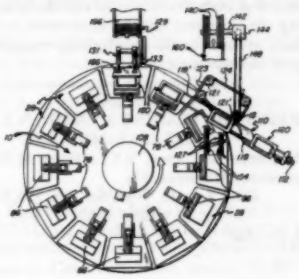
Ronald V. Danforth, West Springfield, Mass., and Medric H. Pleau, Vernon, Conn., assignors to Packaging Systems International, Inc., Ellington, Conn.

Filed Jul. 18, 1986, Ser. No. 888,111
Int. Cl.[4] B65B 7/28, 51/14
U.S. Cl. 53—478 **28 Claims**

1. In a machine for sealing lids to containers having a body with upstanding sidewall portions and a flange portion extending laterally outwardly about the upper periphery thereof, the combination comprising:

a carousel including a revolving horizontal table with means at each of a multiplicity of locations spaced circumferentially thereabout for seating such a container and for providing underlying support for its flange portion, said table also having at each of said seating locations a mechanism thereon for sealing a lid upon a container thereat, said sealing mechanism including a platen movable downwardly against said seating means for applying pressure in cooperation with said seating means and movable concurrently with said table as said table revolves along an arc aqual to at least one-fourth of the circle of rotation of said table; and

an infeed system for delivering such containers sequentially to each of said locations as said table revolves, said system defining a rectilinear feed channel extending along a path substantially tangential to the circle of rotation of said seating means, said infeed system including at least one



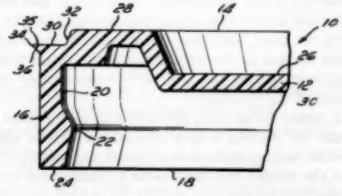
substantially horizontally disposed timing screw disposed at the base of said feed channel along a portion of the length thereof and dimensioned and configured to receive and engage the bottom portion of the body of such containers within the convolution of its thread portion for conveyance therealong from an intake end to an outlet end thereof to produce a predetermined spacing of the containers along said feed channel defined by said thread portion of said timing screw, a guide element having a surface portion disposed laterally adjacent and upwardly of said screw and extending generally parallel to the axis thereof for abutment by the containers conveyed thereby, and means adjacent said intake end of said timing screw for supporting the containers in a horizontal attitude and for sequentially presenting them to the upper portion of said screw.

4,691,501

METHOD OF FEEDING AND APPLYING RIDGED CONTAINER CLOSURES

Robert F. King, La Habra Heights, Calif., assignor to King Plastics, Inc., La Habra Heights, Calif.

Filed Jun. 10, 1985, Ser. No. 742,996
Int. Cl.[4] B65B 7/28
U.S. Cl. 53—485 **7 Claims**



4. A high-speed method of capping containers, comprising;

providing a stack of flexible lids having a greater outside diameter at their top than at their bottom, said lids having, a circular top surrounded by a depending skirt and a ridge on their upper, external corner protruding beyond the surface of said skirt;

placing said stack of lids edgewise on a rotating rod, with the bottom side of the lids facing the end of the rod which feeds into a chute which positions the lids onto the containers;

using the ridges to create pressure on the lids at the terminal end of the rod, said pressure maintaining the lids in position against a deadplate at the top of the chute so that the lids can be forced into the chute;

restraining the lids from dropping out the bottom of the chute unless the lid is on top of a container;

feeding a row of containers to be capped directly beneath the chute on a conveyor belt, the distance between the conveyor and the chute being such that the top of the container hooks onto the lid which is at the bottom of the chute, and pulls the lid out of the chute; and

passing the container and lid underneath a rotating roller which presses the lid into locking engagement with the top of the container.

4,691,502

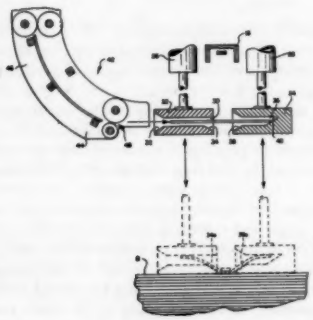
APPARATUS FOR PLACING A CARD ON A BUNDLE OF SHEET-LIKE ARTICLES

Frank H. Convey, Jr., Peru, N.Y., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Aug. 15, 1986, Ser. No. 896,721

Int. Cl.[4] B65B *13/20, 61/20*

U.S. Cl. 53—529 **5 Claims**



1. An apparatus for placing a card on a bundle of sheet-like articles at a typing station where the bundle is tied, said apparatus comprising:

support means for supporting the card adjacent the bundle at the tying station, said support means comprising two spaced pressure blocks for compressing the bundle, said two pressure blocks being movable between an engaged position in which a surface on each block engages the top surface of the bundle for compressing the bundle and a retracted position, each of said two pressure blocks comprising a slot space from said engaging surface, extending parallel to the top surface of the bundle and aligned with the slot in the other of said two pressure blocks for receiving the card, said slots supporting the card adjacent the top surface of the bundle when the respective engaging surfaces of said two pressure blocks engage the top surface of the bundle;

feed means for feeding the card into said aligned slots;

means for placing a strap around the bundle and the card while said surface on each block engages the top surface of the bundle and the bundle is compressed by said pressure blocks and the card is supported adjacent the top surface of the bundle and effecting engagement of the card with the top surface of the bundle to secure the card to the top surface of the bundle upon trying of the strap; and

means for effecting relative movement of said support means and the bundle for stripping the card from said support means.

4,691,503

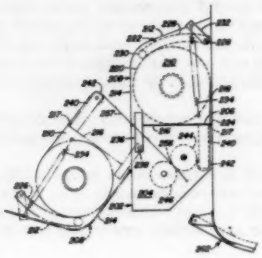
HOUSING FOR HOLDING A SUPPLY ROLL OF LARGE ROUND BALE WRAP MATERIAL

Josef Frerich, Dietrichingen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jul. 8, 1986, Ser. No. 883,793

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—587 **8 Claims**



1. In a large round baler including support structure adjacent a bale-forming chamber, a bale wrapping mechanism mounted to the support structure and including a wrap material supply roll support adapted for supporting a supply roll from which wrap material is pulled during wrapping of a bale located in the chamber, the improvement comprising: said supply roll support being defined in part by a housing including opposite sidewalls joined by top and bottom walls so as to define an opening facing the bale-forming chamber, when the housing is in a normal dispensing position, and a further wall opposite the opening; a panel fixed to the support structure and normally closing said opening; and a housing support including pivot means coupled to the housing and defining a horizontal pivot axis below a portion of the housing bottom wall remote from the chamber and about which the housing is pivotable to a lowered, loading position wherein the opening faces away from said chamber for receiving a supply roll of wrap material for being supported by the bottom wall when the housing is in its dispensing position.

4,691,504

ROTARY MOWER FOR A TRACTOR

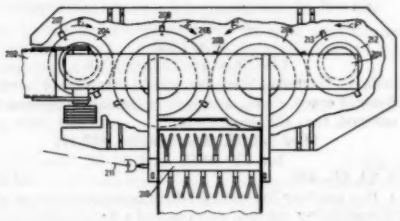
Josef Glunk, Gottmadingen, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed Jan. 14, 1986, Ser. No. 819,157

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501123

Int. Cl.[4] A01D *55/18*

U.S. Cl. 56—192 **5 Claims**



1. In a rotary mower laterally mountable on a tractor comprising a mowing drum mounting member connected to said tractor, a plurality of said mowing drums rotatably mounted on the underside of said mowing drum mounting member with

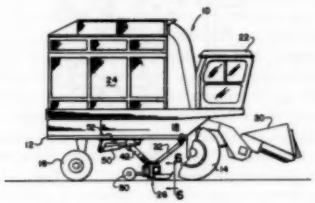
the axes of rotation of said mowing drums substantially upright, at least one cutting tool mounted on a bottom of each of said mowing drums, wherein the cutting diameters for orbits of said cutting tools mounted on adjacent mowing drums overlap each other and said mowing drums are driven rotatably by said tractor, the improvement wherein at least three of said mowing drums are mounted on said mowing drum mounting member, said cutting diameters for said cutting tools mounted on at least two different ones of said mowing drums are different, and at least one of said mowing drums is rotated in a direction of rotation opposite to that of another two of said mowing drums, four of said mowing drums being munted on said mowing drum mounting member, two of said mowing drums being mounted on opposite ends of said mowing drum mounting member and having said cutting tools mounted thereon whose cutting diameters are smaller than said cutting diameters of the remaining mowing drums, the two mowing drums closest to said tractor rotating in the same direction of rotation, the other two of said mowing drum furthest from said tractor rotating in an opposite direction of rotation.

4,691,505

STALK SHREDDER FOR SELF-PROPELLED COTTON STRIPPER

Donald V. Browne, Colorado City, Tex., assignor to Browne Brothers, Inc., Colorado City, Tex.

Filed Jun. 4, 1986, Ser. No. 870,723
Int. Cl.[4] A01O *49/00*
U.S. Cl. 56—503 **3 Claims**



1. A machine for hrvesting four rows of cotton and shredding the stalks after harvest having

a. a frame,
b. two front ground engaging wheels on the frame,
c. two rear ground engaging wheels on the frame,
d. a power unit on the frame,
e. wheel drive means attached from the power unit to the front ground engging wheels for moving the machine in a forward direction,
f. a cotton harvesting element for each row forming means for harvesting cotton from cotton stalks on that row,
g. the four cotton harvesting elements on the frame forward of the front ground engaging wheels, and
h. storage means on said cotton harvesting machine for storing cotton harvested from the stalks;

Wherein the Improved Structure Comprises:

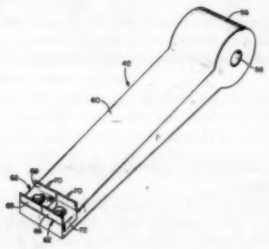
i. a horizontal traverse shredder bar between the front ground engaging wheels and the rear ground engaging wheels,
j. a pivot ear attached to each side of the frame,
k. a support arm pivoted to the pivot ear for supporting the shredder arm,
l. adjustable clamps clamping the support arm to the shredder bar,
m. a pitman pivoted to the clamp on the shredder bar,
n. a lift crank pivoted to
o. a frame bracket attached to the frame,
p. said lift crank pivoted to the pitman,
q. bell crank connected to the lift crank,
r. a hydraulic cyliner connecting the bell crank to the frame bracket so that operation of the hydraulic cylinder will act to raise and lower the shredder bar,
s. two gauge wheels,
t. a carriage clamp attached to the shredder bar near each end of the shredder bar,
u. a carriage vertically adjustable on the carriage clamp,
v. one of said gauge wheels attached to each carriage,
w. a shredder unit for shredding stalks for each row harvested,
x. a shredder bracket for each shredder unit clamped to the shredder bar,
y. said shredder unit attached to said shredder brackets,
z. a right angle gear drive on each of said shredder unit,
aa. a shredder blade attached to the right angle gear drive,
bb. a drive shaft journalled to the shredder bar parallel thereto,
cc. a drive belt at each shredder unit,
dd. said drive belt unterconnecting a sheave on the drive shaft with a sheave on the right angle gear drive, and
ee. a hydraulic motor connected to said drive shaft.

4,691,506

APPARATUS FOR DEFOLIATING SUGAR BEETS AND THE LIKE UTILIZING FLEXIBLE FLAILS WITH RIGID CUTTING MEMBERS AT THE FREE ENDS THEREOF

Schwitters, Wayne J., Clara City, Minn., assignor to WIC, Inc., Shelly, Minn.

Filed Jun. 17, 1985, Ser. No. 745,191
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.
Int. Cl.[4] A01D *23/02*
U.S. Cl. 56—121.4 **20 Claims**



1. Apparatus for defoliating sugar beets and the like comprising a frame including front, rear and side members, at least one rotor journaled for rotation between said side members, a plurality of flexible polyurethane flails, means for pivotally connecting said flails to said rotor adjacent one end thereof, and rigid means mounted on each of said flails adjacent the other end thereof.

4,691,507

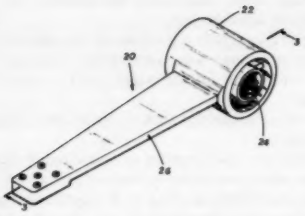
POLYURETHANE FLAIL FOR USE IN DEFOLIATING SUGAR BEETS AND THE LIKE

Wayne J. Schwitters, Clara City, Minn., assignor to WIC, Inc., Shelly, Minn.

Filed Oct. 15, 1985, Ser. No. 773,121
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.
Int. Cl.[4] A01D *23/02*
U.S. Cl. 56—121.4 **21 Claims**

1. A flexible flail for use in defoliating sugar beets and the like comprising a relatively flexible polyurethane shank, a

polyurethane hub integral with one end of said shank for attachment to a rotor of defoliating apparatus, and a plurality of



metal relatively rigid studs projecting from one side of said shank adjacent the other end thereof.

4,691,508

SPINNING OR TWISTING MACHINE WITH A DRIVE BELT PERFORMANCE MONITOR

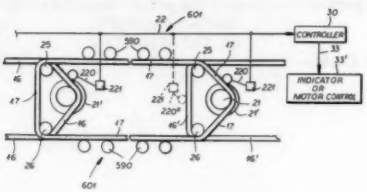
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Feb. 27, 1986, Ser. No. 834,627

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506822

Int. Cl.[4] D01H *13/14*

U.S. Cl. 57—78 **8 Claims**



1. A textile machine for spinning or twisting yarn, comprising in combination:

a plurality of groups of operating units rotatable for spinning or twisting yarn spaced apart longitudinally along the length of the textile machine, each of said groups of operating units comprising at least one row of rotatable elements tangentially drivable to rotate the respective operating units;

a respective drive belt tangentially engaging each of the rotatable elements of a respective group and a resepctive pair of guide rollers around which said belt passes at each of two opposite ends of the respective row, whereby a plurality of said drive belts each driving only the elements of the respective group are arrayed longitudinally along said machine and between opposite ends of the machine, looping ends of adjacent belts overlapping, each of said belts passing around and engaging the pair of guide rollers about which an adjacent belt passes at each overlap between said belts;

at least one drive motor connected to at least one of said belts and forming a drive means for driving said belts and said machine;

a respective drive-belt-performance-monitoring means for each of said belts for sensing a deviation from normal operation of a drive belt monitored thereby tending to cause yarn breakage in the group of operating units of the row of elements tangentially driven by the monitored drive belt subject to said deviation; and

control means responsive to said monitoring means and coupled to said drive means for inactivating said drive means and shutting down said machine upon the detection of said deviation by the respective monitoring means of any of said belts.

4,691,509

OPEN-END FRICTION SPINNING MACHINE

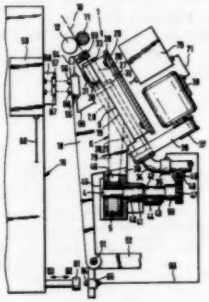
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Continuation of Ser. No. 692,972, Jan. 22, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 898,848

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402367

Int. Cl.[4] D01H *7/882, 13/26*

U.S. Cl. 57—264 **22 Claims**



1. An open-end friction spinning machine of the type having at least one spinning unit, each of said at least one units including:

two drivable, oppositely moving friction surface means defining a yarn formation zone for creating a friction effect, said friction effect resulting from coefficient of friction effects of the friction surface means and air flow effects at said friction surface means,

friction surface driving means for driving the friction surface means during spinning operations,

fiber feeding means for feeding separated fibers to the yarn formation zone,

yarn withdrawal means for withdrawing formed yarn from the yarn formation zone; and

suction means for applying suction forces to the yarn formation zone,

wherein each spinning unit is equipped with individually adjustable friction effect changing means for changing a parameter of the friction effect in the yarn formation zone,

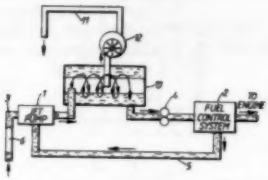
wherein at least one measuring device means is provided for continuously directly examining the quality of the moving yarn at a spinning unit while spinning when the measuring device means is in operation at the respective spinning unit, and

wherein evaluating device means are provided for evaluating the signals of the measuring device and for triggering an automatic adjustment of the friction effect changing means while spinning when deviations exist from indicated desired values.

4,691,510
FUEL SUPPLY SYSTEMS

Peter J. Taylor, Fareham; Alan Clarke, Gosport, and John S. Thompson, Fareham, all of England, assignors to Plessey Overseas Ltd., Ilford, England

Filed Apr. 16, 1985, Ser. No. 723,872
Claims priority, application United Kingdom, Apr. 17, 1984, 8409999
Int. Cl.[4] F02C 7/236
U.S. Cl. 60—39.094 1 Claim



1. A fuel supply system for use in rotary wing aircraft, said system comprising:

vortex separator means including a chamber having a liquid fuel portion and an air and fuel vapor portion, said chamber having an inlet for passage of fuel mixture from a fuel supply tank of the rotary wing aircraft into the vortex separator means, and having an outlet for conveying a liquid fuel supply from the vortex separator means;

first pump means having an input port and an output port, the input port extending into the air and fuel vapor portion of the vortex separator means, the first pump means being operative for producing a relatively low pressure region within the air and fuel vapor portion of the vortex separator means for drawing air and fuel vapor therefrom;

discharge output means connected to the output port of the first pump means for conveying air and fuel vapor to the fuel supply tank, said first pump means being operative for producing a relatively high pressure within the discharge output means to provide a pressure differential between said input port and said output port so that air and fuel vapor from the fuel mixture can be discharged from the vortex separator means;

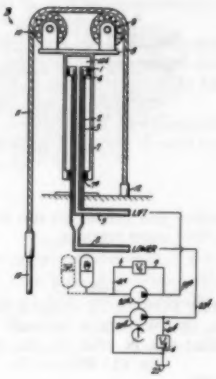
feed means coupled to the vortex separator means for inducing a fuel mixture to swirl within the vortex separator means so as to produce a relatively high pressure region therein so that air and vapor of the fuel mixture can migrate to a relatively low pressure region and liquid fuel of the fuel mixture can migrate to a relatively high pressure region, the outlet of said vortex separator means being situated in the relatively high pressure region so that liquid fuel at the outlet is at the relatively high pressure;

said feed means including a second pump means, fuel control means for controlling the fuel supply to an engine of the rotary wing aircraft, a jet pump, and a fuel line, said second pump means being connected between the outlet of the vortex separator means and the fuel control means and being operative for pumping liquid fuel at relatively high pressure from the vortex separator means to the fuel control means at a relatively higher pressure, the jet pump communicates with the inlet to the vortex separator means and a source of a fuel mixture for feeding the fuel mixture into the inlet of the vortex separator means, and the fuel line extends between the fuel control means and the jet pump for carrying excess fuel from the fuel control means to the jet pump, which excess fuel drives the jet pump by virtue of its relatively higher pressure so that the fuel mixture fed to the vortex separator means is induced to swirl therein.

4,691,511
HYDRAULIC WELL PUMP

William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 449,823, Dec. 14, 1982, Pat. No. 4,571,939.
This application Oct. 23, 1985, Ser. No. 790,417
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—414 10 Claims



1. A system for operating a sucker rod string connected with a well pump comprising:

a double-acting fluid cylinder having opposing power ends;

means for connecting said cylinder with said sucker rod string for raising and lowering said string to operate said pump;

hydraulic pump means for supplying pressurized fluid alternately to the cylinder ends including a direction control movable between extend and retract conditions to extend and retract said cylinder;

drive means for shifting said direction control;

control means for operating said drive means responsive to the extend and retract movements of said cylinder; and

means for applying a fluid counterbalancing force into said cylinder for offsetting the combined weights of said sucker rod string, a production fluid column in a well bore above said pump, and movable surface equipment supported on said cylinder including an accumulator connected with said hydraulic pump means and said direction control for supercharging the intake of said pump during said extend movement of said cylinder and for applying an opposing hydraulic force to said cylinder during said retract movement.

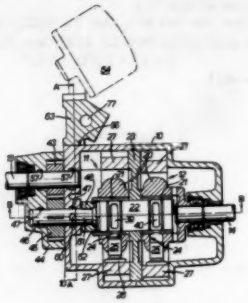
4,691,512
ROTARY HYDROSTATIC MACHINES OR TRANSMISSIONS

Christian H. Thoma; George D. Mc. Arnold, and Arthur A. Blair, all of Channel Islands, Great Britain, assignors to UNIPAT AG, Glarus, Switzerland

Filed Nov. 5, 1984, Ser. No. 668,018
Claims priority, application United Kingdom, Nov. 3, 1983, 8329441; Dec. 9, 1983, 8332982
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—456 8 Claims

1. A hydrostatic machine including a casing, a rotary member for rotation within the casing and formed with generally radial cylinders each accommodating a piston connected to a slipper which engages a surrounding cam track as the member rotates, and including an external shaft, and transmission means including reduction gearing for coupling the rotary member to said external shaft, said reduction gearing comprising a rela-

tively small diameter gear connected to said external shaft and a relatively large diameter gear connected to said rotary member, said reduction gear pair acting also as a fluid gear pump for supplying fluid under pressure.



4,691,513

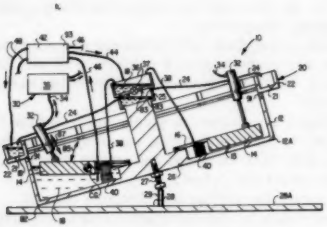
ROTARY POWER TRANSDUCER SYSTEM

James Gillilan, 1807 W. College, Sherman, Tex. 75090

Filed Aug. 11, 1986, Ser. No. 895,157

Int. Cl.[4] F03B *13/14*

U.S. Cl. 60—495 **17 Claims**



1. A rotary energy transducer system comprising:

a flotation tank adapted for generally circular swivel action having fluid disposed therein;

means for centrally supporting said flotation tank for swiveling therearound through a series of unbalanced positions;

means for swiveling said tank around said central support and shifting said fluid disposed therein;

a plurality of flotation means disposed within said tank adapted for floating upon said fluid disposed within said tank; and

means coupled to said flotation means for actuation therewith in transducing energy from shifting fluid levels within said tank throughout the swiveling thereof.

4,691,514

WATER ENGINE

Iain M. Smith, Rochdale, England, assignor to Aur Hydropower Limited, London, England

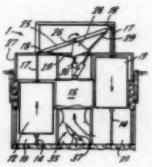
Continuation-in-part of Ser. No. 583,546, Feb. 24, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 898,542

Claims priority, application United Kingdom, Feb. 25, 1983, 8305334

Int. Cl.[4] F03N *13/12*

U.S. Cl. 60—503 **8 Claims**

1. A water engine of the kind having at least two chambers, a float in each chamber, means mounting each float for vertical reciprocal movement in its respective chamber, means for supplying water from a head of water to each chamber to cause the float in each chamber to rise, means for exhausting water from each chamber to allow the float in each chamber to fall, and means for controlling the water supplying and exhausting means to provide inlet an outlet of water to and from each chamber in turn so that the floats in the chambers are caused to alternately rise and fall in turn one after another, and further comprising a rocking beam, means mounting the rocking beam for pivotal movement about a substantially horizontal axis, means connecting the at least two floats to the rocking beam, one to either side of the said axis, whereby the alternate rise and fall of the floats in their respective chambers causes the rocking beam to oscillate, means being provided for deriving power from the oscillatory movement of the rocking beam, said controlling means comprising a single valve member mounted for movement between one position directing water to one chamber while allowing water to exhaust from the other chamber, and another position directing water to the other chamber while allowing water to exhaust from the one chamber.



4,691,515

HOT GAS ENGINE OPERATING IN ACCORDANCE WITH THE STIRLING PRINCIPLE

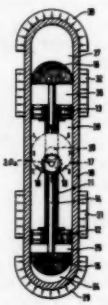
Dietrich Ehrig, Grasberg, and Hans-Juergen Jacobs, Stuhr, both of Fed. Rep. of Germany, assignors to ERNO Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,509

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408480

Int. Cl.[4] F02G *1/04*

U.S. Cl. 60—526 **10 Claims**



1. Hot gas engine operating in accordance with a Stirling engine type principle comprising,

a cylinder having spacially separated external means in heat conductive relationship with the interior of the cylinder and establishing separated hot and cold zones therein;

a piston operating as displacement as well as regenerator piston moveable in said cylinder;

a working piston likewise moveable in said cylinder and also relative to the regenerator piston wherein said displacement piston is mounted on a piston rod traversing said working piston, said working piston being mounted on a hollow piston rod being traversed by the piston rod mounted to said displacement piston; and

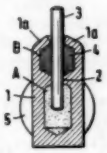
transmission gear means constructed to operate in a crank shaft manner by converting a rotary motion into linear motions for the two pistons and being accordingly coupled to both said pistons and having a common rotary input-output.

4,691,516

THERMALLY-ACTIVATED DEVICE FOR CREATING CONSIDERABLE POWER

Paolo Fornasari, Casale Monferrato, Italy, assignor to Eltek S.p.A., Alessandria, Italy

Filed Feb. 14, 1986, Ser. No. 830,257
Claims priority, application Italy, Feb. 22, 1985, 53024/85[U]
Int. Cl.⁴ F03G *7/06*
U.S. Cl. 60—527 **11 Claims**



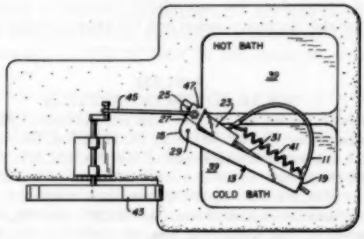
1. A thermally-activated device generating considerable power; said power being in the form of an axial thrust transmitted to a rod, said device comprising a metal casing divided into two chambers connected by a tubular passage; the first chamber containing wax or other material having high thermal dilative properties; and the second chamber containing a biconical mass with a vertical hole, coaxial to the tubular passage; said mass being made of a synthetic thermally-expandable material; a cylindrical metal rod passing vertically through said mass; one end of the rod being immersed in the contents of said first chamber consisting of wax or other thermally expandable material and the other end of the rod projects from the top of the casing at the end opposite to the blind end in order to create a power device that causes the axial movement of rod towards the outside of the casing when the device is thermally activated by means of any source of heat.

4,691,517

LATERALLY OSCILLATING NITINOL ENGINE

Ridgway Banks, 7411 Park Vista, El Cerrito, Calif. 94530

Filed Nov. 12, 1986, Ser. No. 929,507
Int. Cl.⁴ F03G *7/06*
U.S. Cl. 60—527 **3 Claims**



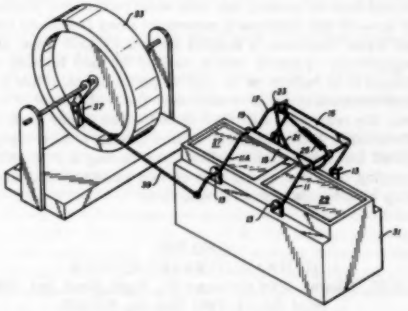
1. A laterally oscillating nitinol engine comprising
a first L-shaped drive member journalled for pivoting horizontal oscillation about the juncture of the legs of the L-shaped member,
a second drive member journalled for pivoting about a point proximate the outboard end of the shorter leg of the L-shaped member at a distance from the pivot journal of the L-shaped member,
a bearing block secured to the end of longer leg of the L-shaped member and having a guide hole therethrough, said second member extending through said guide hole and arranged to reciprocate therein,
a shape memory alloy power element disposed in flexure secured at its ends to said bearing block and to said second member intermediate the sliding connection with said bearing block and the pivotal connection of said second member,
means for disposing different temperature baths below said element whereby as said drive members oscillate about their journals the element alternately dips into one bath and then the other, and
means for absorbing a portion of the energy developed by the engine and moving the power element from the cold bath to the hot bath.

4,691,518

VERTICALLY OSCILLATING HEAT ENGINE

Ridgway Banks, 7411 Park Vista, El Cerrito, Calif. 94530

Filed Nov. 12, 1986, Ser. No. 929,508
Int. Cl.⁴ F03G *7/06*
U.S. Cl. 60—527 **5 Claims**



1. A vertically oscillating nitinol engine comprising
at least a pair of vertically projecting drive posts journalled at a fixed distance from each other for at least partial rotational motion at their lower ends whereby said posts can be rocked back and forth or oscillated about their lower ends in parallel relation,
at least one linkage bar interconnecting and journalled to said projecting drive posts equal distant along said posts from said journals, the connection length along said bar between said posts being equal to the distance between said journals whereby said posts and said linkage bar and the fixed distance between said journals at the lower ends of of said drive posts form a four bar linkage,
at least one a shape memory alloy element disposed in flexure interconnecting the upper ends of said drive posts, one of said connections of said element with said drive posts being a further distance from the journal at the lower end of the drive post than the other connection of the element with the other drive post,
means for disposing different temperature baths below said element whereby as said drive posts oscillate about their journals the element alternately dips into one bath and then the other,
and means for absorbing a portion of the energy developed by the engine and utilizing it to swing the drive posts from the cold bath to the hot bath.

4,691,519

MASTER CYLINDER

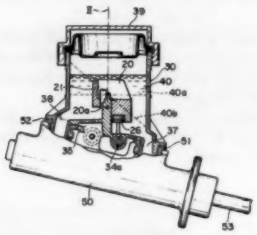
Munesato Andoh, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Japan

Filed Sep. 25, 1985, Ser. No. 779,889

Claims priority, application Japan, Oct. 9, 1984, 59-152839[U]

Int. Cl.[4] F15B *7/00*

U.S. Cl. 60—535 **2 Claims**



1. A cylinder construction for a tandem fluid pressure system, comprising a housing defining a liquid reservoir, a central upstanding partition centered within said reservoir, a float for floating on liquid in said liquid reservoir and having a vertical guideway into which said partition extends providing a guide for said float for guiding said float along its center of buoyancy for upward and downward movement along the center line of said liquid reservoir, a magnet carried by said float, and a magnetically operated switch carried by said housing in a position to be influenced by said magnet when said float is in a predetermined lower position due to the withdrawal of liquid from the reservoir, said float including an upper portion of substantially L-shaped cross section having a face engaging behind one side of said partition and having a front portion engaging on the opposite side of said partition, said magnet being held by the bottom of said float.

4,691,520

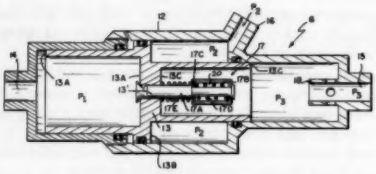
HYDRAULIC BRAKE SYSTEM

Lyle E. Osborne, 1506 Stanmore Ct., South Bend, Ind. 46614

Filed Jul. 21, 1983, Ser. No. 515,600

Int. Cl.[4] F15B *15/18*

U.S. Cl. 60—593 **20 Claims**



1. Hydraulic brake pressure applying and releasing arrangement for a vehicle braking system subject to high system return pressure, comprising:

a brake valve inlet port for communicating hydraulic fluid under pressure to and from a brake valve,

a brake operating outlet port for communicating hydraulic fluid under pressure to and from, in pressure applying and pressure releasing stages, respectively, a brake of the type having brake return spring means,

and hydraulic fluid control means intermediate the inlet port and the outlet port, said control means including means for amplifying the hydraulic pressure effect in the direction from the outlet port to the return pressure system, by continuously and automatically applying the pressure force of said return pressure with the pressure force of the hydraulic fluid from said brake in the pressure releasing stage, such that the brake return pressure exerted at the outlet port by the brake return springs can be substantially less than the system return pressure.

4,691,521

SUPERCHARGER PRESSURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH TURBOCHARGER

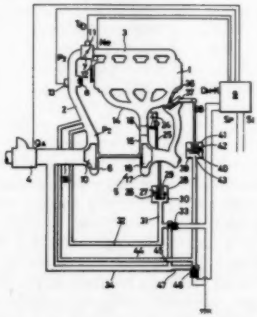
Yuji Hirabayashi, Zushi; Masato Noguchi, Yokohama, and Keiji Hatanaka, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Apr. 24, 1985, Ser. No. 726,773

Claims priority, application Japan, Apr. 25, 1984, 59-81937; Apr. 25, 1984, 59-81938

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—602 **26 Claims**



1. A supercharge pressure control system for an internal combustion engine with a turbocharger comprising:

means for detecting the supercharge pressure of the engine;

regulating means having at least one of a variable geometry means and an exhaust bypass means, for regulating the supercharge pressure of the engine; and

control means for inputting the detected supercharge pressure from the detecting means and for selecting a specific control value based on an intake air flow of the engine in accordance with an accumulated value of a difference between the detected supercharge pressure and a target supercharge pressure, said accumulated value being calculated for each of the variable geometry means and the exhaust bypass means, said control means outputting a suitable control value, based on the specific control value, for controlling the supercharge pressure to each of the variable geometry means and the exhaust bypass means.

4,691,522

SOLAR POWER GENERATION

William G. Brown, II, 720 NW. 31st St., Corvallis, Oreg. 97330

Division of Ser. No. 486,087, Apr. 18, 1983, Pat. No. 4,549,604, which is a continuation-in-part of Ser. No. 122,357, Feb. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 816,501, Jul. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 788,207, Apr. 18, 1977, abandoned. This application Aug. 14, 1985, Ser. No. 765,823

Int. Cl.[4] F03G *7/02*

U.S. Cl. 60—641.8 **21 Claims**

1. An absorption power generating process comprising:

injecting low pressure steam at a subatmospheric pressure into an absorber chamber;

injecting a rich desiccant into said absorber chamber;

absorbing at least a portion of said low pressure steam into

said rich desiccant to release heat from said desiccant and produce a weakened desiccant;

removing at least a portion of said weakened desiccant from said absorber chamber;

vaporizing at least a portion of the water from said weakened desiccant in an atmosphere of air to enrich said weakened desiccant;

transferring said released heat from said absorber chamber to a stream of water to produce high pressure steam;

expanding said high pressure steam through a turbine to produce power and low pressure steam.

4,691,523

THERMODYNAMIC PROCESS FOR A PRACTICAL APPROACH TO THE CARNOT CYCLE

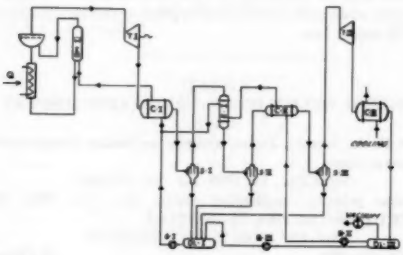
Serafin M. Rosado, Marques de Lozoya 15, Madrid, Spain

Filed Jun. 13, 1984, Ser. No. 620,364

Claims priority, application Spain, Jun. 13, 1983, 523210

Int. Cl.⁴ F01K *25/06*

U.S. Cl. 60—649 **19 Claims**



1. A process for mechanical power generation comprising:

(a) selecting a working fluid mixture comprising a plurality of fluids having different boiling points wherein

(1) at a maximum working temperature and pressure, the mixture of vapors of such fluids is saturated with respect to the component having the highest boiling point, and

(2) the fluid having the lowest boiling point saturates at a minimum working temperature, for a minimum working pressure;

(b) performing one expansion in an expansion device of the mixture of fluid vapors initially saturated with respect to the component having the highest boiling point, from the maximum working pressure to the minimum working pressure;

(c) performing a stage of heat recovery, with heat exchange between (1) the mixture of fluids exhausted by said expansion device, which yields heat and undergoes condensation of at least some of its components, and (2) a fluid mixture coming from a final condenser and compressed to the maximum working pressure, which absorbs heat and undergoes vaporization of at least some of its components;

(d) performing total condensation in said condenser of the mixture that comes out of the hot side of the heat recovery stage, at the minimum working temperature; and

(e) contributing heat to the fluid mixture, once the latter has come out of the cold side of the heat recovery stage, until all the remaining liquid fraction in the fluid mixture that corresponds to the component having the highest boiling point is vaporized.

4,691,524

ENERGY STORAGE AND RECOVERY

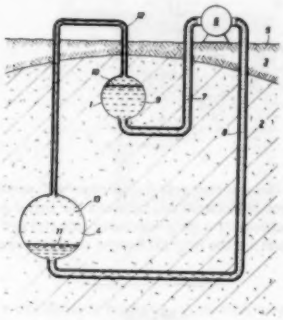
Hugo Holscher, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 1, 1986, Ser. No. 891,798

Claims priority, application Netherlands, Aug. 6, 1985, 8502194

Int. Cl.⁴ F01K *13/02*

U.S. Cl. 60—652 **34 Claims**



1. A system for the storage and recovery of energy comprising:

a first storage space partly filled with a first fluid having a relatively high density;

a second storage space partly filled with a second fluid having a relatively low density, which fluids are hardly or not at all miscible with each other;

a connecting line filled with the second fluid and located between the top part of the first storage space and the top part of the second storage space; and

a pump/turbine unit at approximately the same height as, or above, the first storage space, the pump/turbine unit being connected to the bottom part of the first storage space and to the bottom part of the second storage space in order, during normal operation, to be able to pump the first fluid from the second storage space to the first storage space or to be driven by the first fluid flowing from the first storage space to the second storage space.

4,691,525

METHOD OF OPERATING AN ABSORPTION HEAT PUMP OR REFRIGERATOR, AND AN ABSORPTION HEAT PUMP OR REFRIGERATOR

Pouwel J. Gelderloos, Ugchelen, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek, Netherlands

Filed Apr. 7, 1986, Ser. No. 848,992

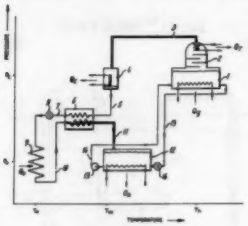
Claims priority, application Netherlands, Apr. 9, 1985, 8501039

Int. Cl.⁴ F25B *15/00*

U.S. Cl. 62—101 **10 Claims**

1. Method of operating an absorption heat pump or refrigerator, consisting at least of a refrigerant circuit and a refrigerant-containing soluton circuit, with a generator for evaporating refrigerant from the solution with the supply of relatively high-temperature heat, a condenser for condensing refrigerant and giving up heat at an intermediate temperature level, an evaporator for evaporating refrigerant with the absorption of heat from a relatively cold heat source, a heat exchanger for transferring heat from the liquid passing out of the condenser to the refrigerant vapour and liquid coming from the evaporator, an absorber for absorbing refrigerant vapour into the solution with the giving-up of heat at an intermediate temperature level, and means for circulating the solution or maintain-

ing the pressure, characterized in that the delivery of refrigerant is regulated in such a manner that the temperature differential Δt_w between the liquid entering the heat exchanger on the condenser side (t_1) and the liquid and vapour leaving the heat



exchanger on the absorber side (t_4) substantially coincides with the temperature differential Δt_k between the liquid passing out of the heat exchanger on the evaporator side (t_2) and the liquid and vapour entering the heat exchanger on the evaporator side (t_3).

4,691,526

AIR CONDITIONING UNIT FOR VEHICLE

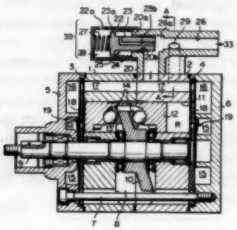
Hisao Kobayashi; Katsunori Kawai, and Hiroyuki Deguchi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 28, 1986, Ser. No. 856,762

Claims priority, application Japan, May 8, 1985, 60-97541

Int. Cl.[4] F25B *31/00, 41/04*

U.S. Cl. 62—217 **6 Claims**



6. An air conditioning unit for a vehicle, comprising:

a reciprocatory piston type refrigerant compressor having a suction chamber for a refrigerant before compression, a discharge chamber for a refrigerant after compression, and a drive chamber formed to be independent of the suction and discharge chambers and accommodating therein a drive mechanism for reciprocating pistons in compressor cylinders, the drive mechanism being driven by a vehicle engine;

a first piping circuit for delivering said refrigerant after compression from said discharge chamber of said compressor toward an evaporator for conducting a thermal exchange of said refrigerant;

a second piping circuit for returning said refrigerant after thermal expansion from said evaporator toward said suction chamber of said compressor;

a condenser arranged in said first piping circuit for condensing said refrigerant after compression, delivered from said discharge chamber of said compressor;

an expansion valve arranged in said first piping circuit between said condenser and said evaporator for controlling a flow rate of said refrigerant after condensation;

a pressure control valve arranged in said second piping circuit between said evaporator and said suction chamber of said compressor for controlling an evaporating pressure within said evaporator in response to a cooling load applied to said air conditioning unit, wherein said pressure control valve is a pressure sensitive spool valve integrally attached to a suction flange mounted on said compressor to introduce said refrigerant after said thermal exchange into said suction chamber, said pressure sensitive spool valve comprising a cylindrical casing fixed to said suction flange and defining therein a first atmospheric pressure chamber, a spool valve movably mounted in said cylindrical casing to adjustably open and close a suction valve port of a suction passageway formed in said suction flange, a spring member arranged in said atmospheric pressure chamber of said cylindrical casing for constantly urging said spool valve toward a position closing said suction valve port, and an elastic bellows member elastically and sealingly arranged between said cylindrical casing and said spool valve for defining a suction pressure chamber separated from said atmospheric chamber, and said suction valve port of said suction passageway of said flange is a counterbore formed in said flange so as to be complementary to an end of said spool valve; and

a fluid bypass passageway means arranged in said second piping circuit for providing a constant fluid communication between said evaporator and said drive chamber of said compressor, thereby permitting said refrigerant after said thermal exchange to flow into said drive chamber even when said cooling load applied to said air conditioning unit is low.

4,691,527

CONTROL DEVICE FOR REFRIGERATED DISPLAY CASE

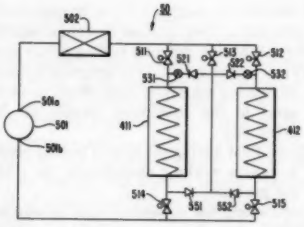
Hideo Ikeda, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Dec. 11, 1985, Ser. No. 807,844

Claims priority, application Japan, Dec. 11, 1984, 59-186708[U]; Dec. 11, 1984, 59-186709[U]

Int. Cl.[4] F25D *21/00*; **F25B** *47/00*

U.S. Cl. 62—234 **18 Claims**



1. In a refrigerated display case comprising an external housing, an internal housing within the extension housing for storing merchandise, a front opening for access to the interior of said internal housing, passage means formed between said external and internal housing which includes inner and outer conduits interconnecting respective inlets and outlets extending across opposed edges of said front opening, circulating means for driving air around said passage means through said conduits in the form of inner and outer air curtains and a refrigeration unit to cool said display case, said refrigeration unit having a compressor, a condenser and first and second evaporators, the improvement comprising:

said first evaporator being disposed in said inner conduit;

said second evaporator being disposed in said outer conduit, the inlet side of said first evaporator being coupled to the inlet side of said second evaporator by a first passage line in which the outlet side of said first evaporator being

coupled to the discharge side of said second evaporator by a second passage line in which third and fourth check valves are disposed in series, said first and second passage lines being connected to each other by a third passage line;

said condenser being coupled to the inlet side of said first and second evaporators and said first and third passage lines by a plurality of valve devices;

said compressor having its discharge side coupled to the inlet side of said condenser and its suction side connected to the outlet sides of said first and second evaporators through a plurality of valve devices; and

control means for controlling the operation of said refrigeration unit by operating said first and second evaporators in series and in parallel in accordance with a predetermined program.

4,691,528

AIR-COOLED ABSORPTION TYPE WATER COOLING/HEATING APPARATUS

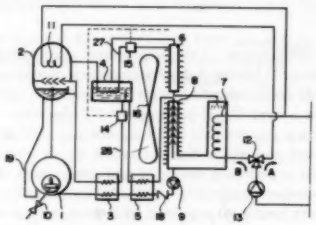
Shinji Tongu, Hamamatsu, Japan, assignor to Yazaki Corporation, Japan

Filed Sep. 22, 1986, Ser. No. 909,718

Claims priority, application Japan, Aug. 15, 1985, 60-179954; Sep. 24, 1985, 60-210706

Int. Cl.[4] F25B *27/00*

U.S. Cl. 62—238.3 **16 Claims**



1. An air-cooled absorption type water cooling/heating apparatus comprising:

I. a cooling circulation system including:

(a) a high-temperature regenerator in which a thin solution which has absorbed a refrigerant is heated so that refrigerant vapor and thick solution are regenerated;

(b) a separator for separating said refrigerant vapor and said thick solution from each other;

(c) an air-cooled condenser for condensing said refrigerant vapor into liquid phase by air-cooling;

(d) an evaporator in which the condensed liquid refrigerant is evaporated by heat derived from a heat exchanger leading to a heat radiator, thereby cooling a heat transfer medium circulated through said heat exchanger;

(e) an absorber in which the refrigerant vapor generated in said evaporator in said thick solution introduced from said separator, said absorber being air-cooled so that the heat produced as a result of the absorption is carried away by the cooling air; and

(f) a pump for supplying the thin solution which is formed from said thin solution as a result of absorption of said refrigerant vapor into said high-temperature regenerator;

II. a heating circulation system including:

(g) a heat exchanger provided in said separator and leading to said heat radiator; and

III. means for closing a line between said separator and said condenser and a line between said separator and said absorber during operation of said apparatus in the heating mode.

4,691,529

ABSORPTION REFRIGERATOR FOR ICE-MAKING

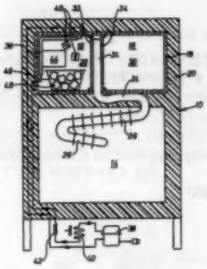
Peter E. Blomberg, Stockholm, and Sven A. Gurt, Solna, both of Sweden, assignors to AB Electrolux, Stockholm, Sweden

Filed Oct. 8, 1986, Ser. No. 916,956

Claims priority, application Sweden, Oct. 23, 1985, 8504995

Int. Cl.[4] F25B *25/02*

U.S. Cl. 62—332 **3 Claims**



1. In a refrigerator having a compression-type refrigerating apparatus provided with an evaporator and an absorption-type refrigerating apparatus provided with an evaporator, a refrigerating chamber, the improvement comprising: two spaced freezer chambers, a heat conducting wall for each freezing chamber, the evaporator of said absorption refrigerating apparatus having the colder part in said space between said freezer chambers and in contact with said heat conducting walls, the warmer part of said evaporator being in said refrigerating chamber, said compression-type refrigerating apparatus having its evaporator operatively connected to one of said freezer chambers, and said absorption-type refrigerating apparatus being operated independent of the operation of said compression-type refrigerating apparatus.

4,691,530

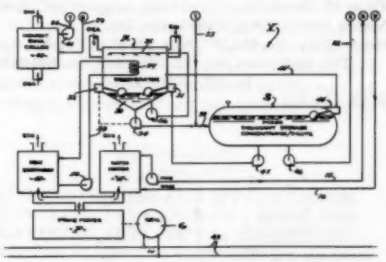
COGENERATION AND CENTRAL REGENERATION MULTI-CONTACTOR AIR CONDITIONING SYSTEM

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 92343

Filed Sep. 5, 1986, Ser. No. 903,690

Int. Cl.[4] F25D *23/00*

U.S. Cl. 62—238.1 **22 Claims**



1. A central regeneration multi-contactor air conditioning, including:

a support system comprised of a desiccant regenerator means continuously removing desiccant liquid from a storage means and simultaneously returning regenerated desiccant liquid thereto for maintaining a useable desiccant vapor pressure condition controlled by concentration and temperature thereof in said storage means,

and an air handling system comprised of a multiplicity of desiccant contactor means operated on demand and each

drawing the desiccant liquid of useable concentration and temperature from the storage means for dehumidification of air passed therethrough,

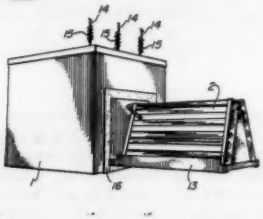
the storage means being comprised of a tank with a return of diluted desiccant liquid from the multiplicity of desiccant contactor means, a delivery of desiccant liquid from the tank to the regeneration means, a return of strengthened desiccant liquid from the regenerator means to the tank, and a supply of useable desiccant liquid from the tank to the contactor means.

4,691,531

CENTRAL AIR CONDITIONING SYSTEM

Kevin Clifton, P.O. Box 13175, Kanata, Ontario, Canada K2K 1X4, and Sean Delaney, Kanata, Canada, assignors to Kevin Clifton, Kanata, Canada

Filed Jul. 7, 1986, Ser. No. 882,293
Claims priority, application Canada, Mar. 26, 1986, 505252
Int. Cl.[4] T25D *23/12*
U.S. Cl. 62—263 **15 Claims**



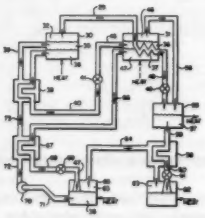
1. An air conditioning system for use in conjunction with a hot air plenum of a residential furnace, comprised of a central unit housing vibration causing components, an evaporator coil, vibration absorbing means for supporting said central unit adjacent said hot air plenum, means integral with and projecting from said central unit through an aperture in said hot air plenum for supporting said coil in said hot air plenum, and resilient means connected to said central unit for effecting a seal around said aperture between said hot air plenum and said central unit.

4,691,532

DUAL COOLING/HEATING SYSTEM ENERGY RECOVERY

Edward A. Reid, Westerville; F. Bert Cook, Columbus, and Edgar M. Purvis, Troy, all of Ohio, assignors to Columbia Gas System Service Corp, Wilmington, Del.

Division of Ser. No. 683,187, Nov. 13, 1984, Pat. No. 4,646,541.
This application Dec. 22, 1986, Ser. No. 945,091
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—476 **11 Claims**



1. In an absorption refrigeration and/or heating system having components connected in series including at least one generator, a condenser, an evaporator, and an absorber, wherein a refrigerant is absorbed and desorbed or expelled in an absorbent solution, and the application of heat and externally supplied mechanical energy is combined and converted to pressure energy that is applied to or removed from a solution of refrigerant and absorbent, the improvement comprising:

(a) means to convert the pressure energy and/or phase change energy in the solution and/or refrigerant to mechanical energy, and

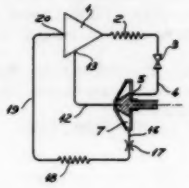
(b) means to replace or supplement the externally supplied mechanical energy in the system with the converted mechanical energy.

4,691,533

REFRIGERATION SYSTEM WITH A CENTRIFUGAL ECONOMIZER

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855

Filed Sep. 15, 1986, Ser. No. 907,080
Claims priority, application France, Sep. 27, 1985, 85 14337
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—512 **1 Claim**



1. A refrigeration or the like system comprising at least a compressor (1) having a discharge orifice connected to a condenser (2) communicating with an expansion valve (3) connected to a centrifugal economiser (7), the latter being connected via a gas conduit to an economiser orifice (13) of the compressor and via a liquid conduit to an evaporator (18) connected to an intake orifice of said compressor, the centrifugal economiser comprising a rotor (8) mounted for rotation in a stationary casing (6) provided with three orifices respectively connected to the expansion valve, to the economiser orifice and to the evaporator, and wherein the liquid conduit has means defining a fixed orifice, (17); the size of which is selected so that, for the highest pressure ratios sustained by the system during permanent operation, the flow of gas through the liquid conduit does not exceed substantially 20% of the flow of gas returning to the economiser orifice.

4,691,534

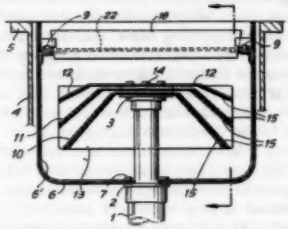
CRYOGENIC PUMP WITH REFRIGERATOR WITH THE GEOMETRY OF THE SHIELDS, SUITABLE FOR ACHIEVING A HIGH EFFICIENCY AND AN EXTENDED LIFE

Lapo Lombardini, and Gianluca Bardi, both of Florence, Italy, assignors to Officine Galileo S.p.A., Italy

Filed Mar. 24, 1986, Ser. No. 843,102
Claims priority, application Italy, Mar. 26, 1985, 9373 A/85
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **4 Claims**

1. A cryogenic pump having a cooling stage with a refrigeration temperature of from 70° to 80° K., at least one second stage connected to said first stage with a refrigeration temperature of from 12° to 15° K., a cylindrical shield having a closed end mounted on said first stage and extending above said second stage and having an opened end with an inlet grid extending across said opened end, said grid having spaced apart obliquely extending laterally spaced planar panels, said shield having condensation walls, said condensation walls and said planar panels comprising at least one metal strip and completely covered by absorbing material on both faces, said strips having externally reflecting surfaces, and a plurality of second

stage planar panels connected to said second stage and being of a light metallic mass with at least one being disposed parallel to the axis of said second stage and at least one of said second



stage panels extending at an angle to the axis of said second stage, and second stage metal strips covering said second stage panels.

4,691,535

METHOD OF AND APPARATUS FOR JOINING A SELECTED YARN TO A YARN BEING KNITTED

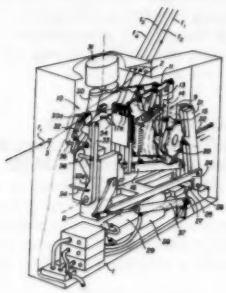
Remi Cottenceau, Viry, France; Francois Fischer, Carouge, and Simon Arieh, Geneva, both of Switzerland, assignors to Mayer & Cie. GmbH & Co. and Sipra Patententwicklungs - und Beteiligungsgesellschaft mbH, both of Albstadt, Fed. Rep. of Germany

Continuation of Ser. No. 445,987, Dec. 1, 1982, abandoned. This application Nov. 19, 1985, Ser. No. 799,552

Claims priority, application Switzerland, Dec. 3, 1981, 7727/81

Int. Cl.[4] D04B *15/62*

U.S. Cl. 66—144 **4 Claims**



1. A method of joining a yarn selected for knitting to a yarn being knitted, the method comprising the steps of sequentially while the yarn being knitted moves continuously in a travel direction along a path

holding the end of the yarn selected for knitting adjacent the path of the yarn being knitted,

forming a closed loop of the selected yarn in the vicinity of the held end on a finger projecting in the direction of travel of the yarn being knitted,

deflecting the yarn being knitted adjacent and spaced from the held end so as to give the deflected yarn portion the form of an open loop,

passing this open loop through the closed loop on the finger,

gripping the yarn selected for knitting between the open loop and the held end and passing the gripped portion through this open loop,

thereafter generally simultaneously

tightening the closed loop by applying tension to the gripped portion of the yarn selected for knitting to form a knot by pulling the gripped portion in the direction of movement of the yarn being knitted and thereby pulling both loops off the finger, and

cutting the yarn being knitted upstream of the knot relative to the yarn travel direction, and

releasing the held end so that the knotted yarns move off in the travel direction.

4,691,536

DUST REMOVING DEVICE FOR CIRCULAR KNITTING MACHINE

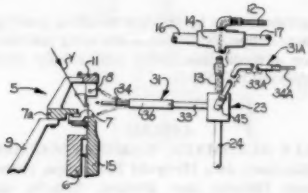
Shozo Yorisue, Hyogo, and Seiji Morimoto, Aichi, both of Japan, assignors to Precision Fukuhara Works, Ltd., Japan

Filed Aug. 7, 1986, Ser. No. 894,656

Claims priority, application Japan, Aug. 30, 1985, 60-192800

Int. Cl.[4] D04B *35/32*

U.S. Cl. 66—168 **3 Claims**



1. A lint removing device for a circular knitting machine including an air jet nozzle having a free open end forming an orifice, means carried by said knitting machine and supporting said air jet nozzle for directing air against an area of said knitting machine adjacent said open end orifice of said air jet nozzle for blowing lint and dust from the portion of said knitting machine adjacent said air jet nozzle, means for supplying air under pressure to said air jet nozzle, means for causing said air jet nozzle to move with a fluttering motion to thereby increase the area of the knitting machine being engaged by the air being ejected from said air jet nozzle orifice, and fluttering motion adjustment means for limiting the swinging movement of said free open end of said air jet nozzle, said fluttering motion adjustment means comprising a flutter limiting member including an outer end portion completely surrounding and normally being spaced from said air jet nozzle, and means supporting said outer end portion of said flutter limiting member for longitudinal adjustment along said air jet nozzle for varying the location longitudinally of said nozzle at which said outer end portion is engaged by said nozzle to thereby vary the amount of swinging movement of said free open end of said air jet nozzle.

4,691,537

MOCK LINKING PROCESS AND APPARATUS FOR JOINING TWO PIECES OF KNITTED FABRIC, AND KNITTED EDGING TRIM FOR USE THEREWITH

John C. Cullen; Paul M. Cullen, both of Main Street, and Owen Cullen, "The Brackens" , all of Monasterevin, Co. Kildare, Ireland

Filed Aug. 28, 1985, Ser. No. 770,265

Claims priority, application Ireland, Aug. 29, 1984, 2203/84

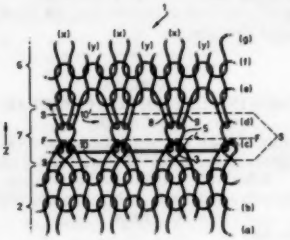
Int. Cl.[4] D04B *9/46;* **D05B** *7/00*

U.S. Cl. 66—172 R **6 Claims**

1. A knitted edging trim, for attachment to an unfinished edge of a knitted garment, which comprises

a ribbon of weft-knitted yarn, double knit, having two parallel longitudinal side edges defining a selvedge and a ravel edge, including a course of transfer stitching spaced from a side edge thereof and defining a fold line, such that when

the trim is folded over upon itself along the fold line, the folded edge of the trim then presents an adjacent seam line traversing outwardly protruding loops defining spaces therebetween, the folded trim being attached to an unfinished garment edge by machine stitching passing through the spaces defined by the seam line using matching yarn to produce a mock link finish substantially simulating a point-to-point link finish.



4,691,538

FULLY AUTOMATIC WASHING MACHINE

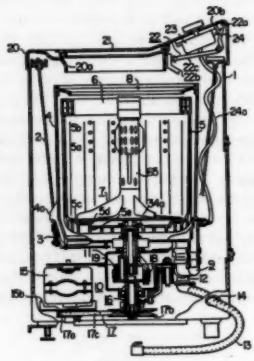
Tamotsu Shikamori, Juo; Hiroyuki Toshimitsu, Hitachi; Hiroshi Ohsugi, Hitachi; Isao Hiyama, Hitachi, and Soichi Fukuzawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 575,785, Feb. 1, 1984, which is a continuation of Ser. No. 347,311, Feb. 9, 1982, abandoned. This application Feb. 28, 1986, Ser. No. 834,393

Claims priority, application Japan, Oct. 7, 1981, 56-158779

Int. Cl.[4] D06F *33/02, 39/02*

U.S. Cl. 68—12 R **6 Claims**



1. A fully automatic washing machine comprising:
an outer shell;
an outer cell supported in said outer shell in a vibration damping manner;
a washing/drying cell rotatably mounted in said outer cell;
a rotary blade unit rotatably provided on a central portion of an inner bottom surface of said outer cell;
a washing machine motor secured to the bottom of said outer cell and adapted to rotate in forward and backward directions in a washing step and a rinsing step and, in a drying step, at a high speed only in one direction;
a clutch mechanism adapted to transmit a torque of said washing machine motor to said rotary blade unit in said washing step and in said rinsing step and to said washing/drying cell in said drying step;
a speed reducing gear adapted to transmit the torque of said washing machine motor to said rotary blade unit at a reduced speed in the forward and backward directions;
a water supplying valve for supplying said washing/drying cell with water;
a draining valve for draining said outer cell; and
an automatic timer adapted to operate said washing machine motor, water supplying valve, and said draining valve in accordance with a predetermined program chart;
characterized in that said rotary blade unit is provided at a center of the upper surface thereof with a cylindrical member, and in that said cylindrical member is provided with a fabric conditioner supplying device capable of supplying a fabric conditioner into said washing/drying cell in the rinsing step taken immediately before said final drying step in a standard program including a plurality of intermediate drying steps and associated rinsing steps operated after said washing step, said standard program includes a first intermediate drying step, a first rinsing step, a second intermediate drying step, and a second rinsing step sequentially operated after a washing step, said fabric conditioner supplying device includes a first vessel for storing said fabric conditioner and a lid detachably secured to said first vessel, said lid including a second vessel for also storing said fabric conditioner, at least one first discharge port provided at an upper portion of said first vessel higher than a water level in the rinsing step, at least one second discharge port provided at an upper portion of said second vessel, and a sack portion provided around said at least one second discharge port, and wherein when said first and second vessels are rotated at a speed equal to the speed of rotation of said rotary blade unit in said first intermediate drying step of high speed, said fabric conditioner in said second vessel flows up along the inner surface of said second vessel and is discharged into said sack portion through said at least one second discharge port, and then, in the first rinsing step of low speed, said fabric conditioner received in the sack portion falls into said first vessel, and next, in the second intermediate drying step, flows from said first vessel along an inner surface thereof and is discharged through said discharge ports into said washing/drying cell.

4,691,539

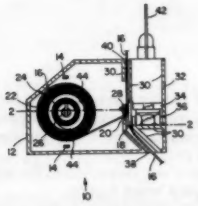
BAND SECURITY LOCK

Gary W. Gover, 630 N. 2nd St., Lakeview, Oreg. 97630

Filed Feb. 19, 1986, Ser. No. 830,729

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—18 **12 Claims**



1. A shackle-type security lock for skis, bicycles and the like comprising:
a thin, flat housing including edge surfaces,
a bi-directional reel rotatably mounted within said housing, said reel mounting a coil of thin, flexible metal shackle band and being spring-biased in a band-coiling direction,
said band having a free end including an anchor clip comprising a locking eye,
said housing including means defining a band exit slot and a band entrance slot in said edge surfaces and an internal guideway for guiding said locking eye through said en-

trance slot toward a predetermined locking position within said housing,

means defining a compression surface within said housing adjacent said locking position,

said band being trained about said compression surface enroute from said reel to said exit slot,

key-operated locking means within said housing operable with a key from without said housing, said locking means including a locking member movable by operation of said key between (a) an unlocked position retracted from said compression surface and locking position in which said band can be freely withdrawn from said housing through said exit slot and said locking eye can be freely withdrawn from said locking position through said entrance slot, and (b) a locked position in which said locking member extends through said locking position and toward said compression surface to extend through said locking eye when at said locking position and compress said band against said compression surface,

whereby said locking member in said locked position prevents both withdrawal of said locking eye from said housing through said entrance slot and said band from said housing through said exit slot.

4,691,540

LOCK FOR SLIDE FASTENER

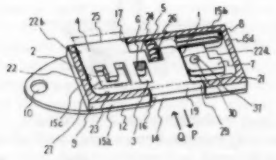
Mikio Murase, Osakafu, Japan, assignor to Osaka Trunk Material Co., Ltd., Osaka, Japan

Filed Sep. 16, 1986, Ser. No. 907,849

Claims priority, application Japan, Feb. 7, 1986, 61-17211[U]

Int. Cl.[4] E05B *67/38*

U.S. Cl. 70—68 **8 Claims**



1. A lock for a slide fastener for locking together a first and a second slider with the lock connecting the first slider to a projection on the second slider, the lock comprising

a single integral sliding plate having

an engaging portion on one side thereof,

and a tongue spaced from said engaging portion;

a guiding portion extending in a direction parallel to said tongue;

a case body for containing said sliding plate for reciprocal sliding movement of said sliding plate in the direction longitudinally of said guiding portion;

a corresponding guide member provided in said case body for slidably guiding said guiding portion;

a spring provided in said case body for elastically urging said sliding plate in the direction of extension of said tongue;

a locking member rotatably mounted to move between lock and unlock positions in said case body adjacent to said engaging portion;

said locking member mounted to engage said engaging portion of said sliding plate when said locking member is in the lock position to lock said sliding plate against said reciprocal sliding movement;

said locking member mounted to disengage said engaging portion of said sliding plate when said locking member is in the unlock position to enable said sliding plate to move in said reciprocal sliding movement;

a leaf spring for alternatively stably holding said locking member in each of said lock and unlock positions;

and a cover plate for said case body including

a connecting portion connecting said case body with the first slider,

and having a hole in said cover plate adapted to receive the projection of the second slider at a location corresponding to said tongue.

4,691,541

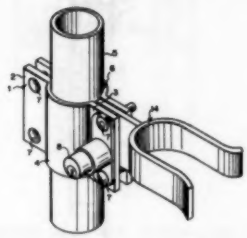
GATE LOCKING DEVICE

Donald E. McQuade, Sr., 1935 N. Railroad Ave., Staten Island, N.Y. 10306

Filed May 15, 1986, Ser. No. 864,643

Int. Cl.[4] E05C *3/14*

U.S. Cl. 70—77 **8 Claims**



1. A gate locking device in combination with a first pipe of a gate closure of a chain link fence, the fence is of the type having a support framework with an overlay of interwoven wire, the fence having an opening defined by a pipework frame with a gate mounted hingeably therein at one side for closing said opening, the frame including said first and a second pipe, said device comprising:

(a) a collar formed by a front piece and a back piece clamped to a first pipe opposite the hinged connection of said gate;

(b) a lock member fixed to a face of one of said front piece and said back piece, said lock member having a lock bar translatable in a line perpendicular to said face;

(c) an oar lock hingeably attached to said collar, movable between a first position where said gate is unlocked and a second position where said oarlock receives a second pipe, adjacent to said first pipe when said gate is in a closed position, within a forked shape portion of said oarlock to prevent relative movement of said first and second pipe in a direction perpendicular to the plane of said gate and thereby prevent opening said gate; and

(d) a plate portion of said oarlock defining a locking opening for receiving said lock bar when said oarlock is moved to the second position and said lock bar is moved to a locking position to thereby prevent hinged movement of said oarlock and lock the gate.

4,691,542

DOOR LOCKING SYSTEM

Quentin H. Young, San Antonio, Tex., assignor to Southern Steel Company, San Antonio, Tex.

Continuation of Ser. No. 393,701, Jun. 30, 1987, Pat. No. 4,509,347. This application Apr. 9, 1985, Ser. No. 721,478

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] E05B *47/00, 65/06*; E05C *1/06, 1/12*

U.S. Cl. 70—129 **2 Claims**

1. An electrically operated door locking system for use in a door mounted in a door jamb comprising:

a modular carrier frame mounted in the door jamb;

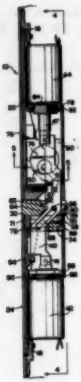
bolt means mounted on said carrier frame for reciprocation between a retracted position wholly enclosed within said carrier frame and an extended position in which one end of said bolt means protrudes from said carrier frame;

a bolt actuator cam slide operable for movement between a

lock position and an unlock position for respectively positioning said bolt means in said extended position or said retracted position;

guide surfaces on said carrier frame for precluding horizontal movement of the bolt actuator cam slide;

solenoid means for selectively positioning said bolt actuator slide in its unlock or lock positions;



a control circuit for said solenoid means including circuit means for actuating said solenoid means to cause the bolt actuator slide to move to its lock position in response to movement of the door to closed position; and

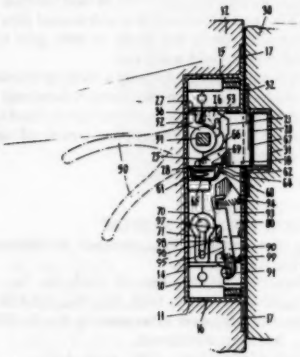
means for preventing actuation of said solenoid means for moving said bolt to its lock position in response to said door not being in a fully closed position.

4,691,543

DEADLOCK WITH KEY OPERATED LOCKING CYLINDER

John R. Watts, 87 Well St., Middle Brighton, Victoria 3186, Australia

Filed Mar. 25, 1986, Ser. No. 843,673
Int. Cl.[4] E05B *55/00*
U.S. Cl. 70—143 **20 Claims**



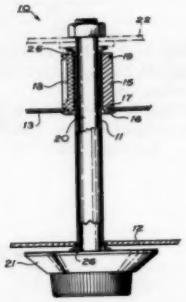
1. A deadlock comprising a lock casing, a locking bolt displaceable within said lock casing, the bolt having a locking tongue arranged, in use, to engage a striker plate, means to displace said locking bolt from a latched position where the tongue extends a short distance out of said lock casing to an unlatched position wherein the tongue is wholly within the casing, locking means comprising a lock slide to drive the tongue past the latched position to a locked position with the locking tongue extending a substantial distance out of the lock casing, and a key operated locking cylinder having an arm which engages the lock slide to displace the slide so that the slide presents an inclined surface to the locking bolt at the rear of the locking tongue to force the tongue outwardly of the casing to the locked position with a portion of the side extending behind the locking tongue, the locking tongue being similarly curved on both sides so that, in use, either side can slide past a striker plate in the latched position thereby enabling the lock to be used in both left and right hand locking doors.

4,691,544

SAFE DOOR BUSHING

Patrick J. Beattie, West Henrietta, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 780,975, Sep. 27, 1985, abandoned, which is a continuation of Ser. No. 520,436, Aug. 4, 1983, abandoned. This application Jul. 28, 1986, Ser. No. 890,862
Int. Cl.[4] E05B *15/00*
U.S. Cl. 70—329 **15 Claims**



1. A safe door bushing system comprising:

a. a hollow stub mounted on an inner wall of said safe door by being fastened to a region of said inner wall around a hole in said inner wall to extend inward toward the interior of the safe from said inner wall where said stub supports combination lock components;

b. a thin walled tube separate from said hollow stub and extending from said hollow stub through said hole in said inner wall and to a hole in an outer wall of said safe door so that said tube spans an insulation-filled space between said inner and outer walls of said safe door where said tube is fixed in place by insulation filling said space; and

c. a lock spindle extending from outside said outer wall rotatably through said fixed tube spanning said insulation-filled space, through said inner wall and said stub and beyond an inner end of said stub to a drive wheel turned by said spindle to operate said lock components on said stub.

4,691,545

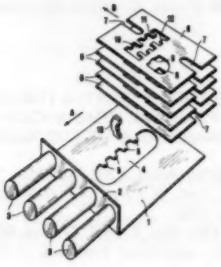
SAFETY LOCK WITH PLURAL TUMBLERS, HAVING A SHAPED CONSENT STUD

Amleto Pagano, Turin, Italy, assignor to SETEC s.r.l., Turin, Italy

Filed Mar. 20, 1984, Ser. No. 592,454
Int. Cl.[4] E05B *21/00*
U.S. Cl. 70—352 **3 Claims**

1. In the combination of a lock and a key, said lock being intended to cooperate with a strike plate and to be operated by said key, said key having at least one web comprising a sequence of teeth, said lock comprising a casing, at least one plate mounted in said casing for movement in a longitudinal

direction therein under action of said key, at least one bolt mounted on said plate, said bolt extending along said longitudinal direction and being adapted to cooperate with a said strike plate, a consent stud mounted on said plate and extending perpendicularly to said longitudinal direction, and a set of superposed tumblers mounted in said casing for movement, under action of said key, in a transverse direction perpendicular to said longitudinal direction of movement of the plate, each said tumbler having an opening adapted to cooperate with one of said teeth of the key web, said openings being identical for all said tumblers, each said tumbler having a window extending in its said longitudinal direction and a number of pairs of opposed teeth extending along said transverse direction and protruding into said window, said pairs of opposed teeth defining a longitudinal passage in each said tumbler for passage of a corresponding portion of said consent stud in said longitudinal direction, said consent stud of the plate traversing the windows of all said superposed tumblers, in order



to allow longitudinal movement of said plate only when said lock is operated by said key, the improvement in which said consent stud is removably mounted on said plate and comprises an integral plurality of superposed portions offset relative to one another in said transverse direction, each said portion of said consent stud being able to pass through the said longitudinal passage of the corresponding tumbler, said key web and said consent stud being so dimensioned that engagement of said key web teeth with said tumbler openings adapted to cooperate with said key web teeth will move said set of superposed tumblers from an initial locked position to a final position wherein each said portion of said consent stud is centered in the corresponding longitudinal passage of each said tumbler, said plate being movable in said longitudinal direction only after said set of tumblers has been moved to said final position by said key, whereby the character of said lock may be changed simply by changing said consent stud, and changing said key in a corresponding manner.

4,691,546

ROLLING MILL CONTROL FOR TANDEM ROLLING

Roy Clegg, Rotherham, England, assignor to Davy McKee (Sheffield) Limited, Sheffield, England

Filed Nov. 8, 1983, Ser. No. 549,744

Claims priority, application United Kingdom, Nov. 11, 1982, 8232188

Int. Cl.[4] B21B *37/12*

U.S. Cl. 72—9 **5 Claims**

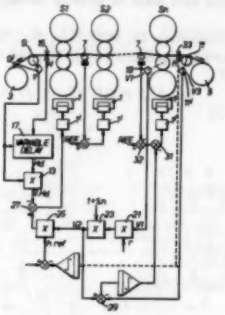
1. A method of operating a rolling mill to roll metal strip wherein said mill has a plurality of rolling mill stands arranged in tandem, and wherein further, the first and last stands of said mill are provided with hydraulic means for controlling the rolling load upon said stands, said method comprising the steps of:

obtaining a first signal representing the product of the velocity and gauge of said metal strip entering said first stand;

obtaining a second signal representing the product of the desired exit speed and the desired exit gauge of said metal strip leaving said last stand of said mill;

obtaining a third signal representing the actual exit speed of said metal strip leaving said last stand of said mill;

comparing said first and second signals and employing the difference, if any, between said first and second signals to adjust said hydraulic means upon said first stand in the sense so as to reduce said difference substantially to zero whereby the entry mass flow of said metal strip will equal the desired exit mass flow of said metal strip; and



comparing said third signal with a fourth signal representing said desired exit speed of said metal strip leaving said last stand and employing the difference, if any, between said third and fourth signals to control the load upon said last stand in the sense so as to reduce said difference substantially to zero whereby said actual exit speed is maintained substantially equal to said desired exit speed and, in turn, the actual exit mass flow of said metal strip is substantially equal to said entry and desired exit mass flows of said metal strip.

4,691,547

ROLLING MILL STRIP THICKNESS CONTROLLER

Eam K. Teoh; Graham C. Goodwin, both of Newcastle, and William J. Edwards, Carey Bay, all of Australia, assignors to John Lysaght (Australia) Limited, Sydney, Australia

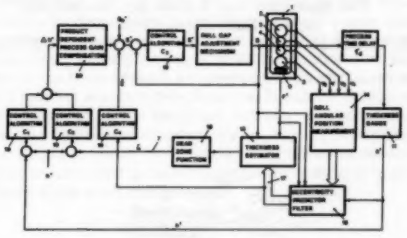
PCT No. PCT/AU84/00172, § 371 Date Apr. 11, 1985, § 102(e) Date Apr. 11, 1985, PCT Pub. No. WO85/00998, PCT Pub. Date Mar. 14, 1985

PCT Filed Sep. 7, 1984, Ser. No. 722,161

Claims priority, application Australia, Sep. 8, 1983, PG1318

Int. Cl.[4] B21B *37/12*

U.S. Cl. 72—16 **18 Claims**



1. A method for automatically controlling the thickness of product emerging from a rolling stand comprising the steps of producing a first input signal indicative of total roll force, producing a second input signal indicative of rollgap position, producing a third input signal indicative of the angular position of a first mill roll, producing a fourth input signal indicative of product thickness at a predetermined downstream location relative to the rollgap, and deriving from said first, second,

third and fourth input signals a first output signal indicative of the total roll eccentricity affecting the true instantaneous roll-gap position as a function of the first mill roll angular position.

4,691,548

ROLLING MILL STAND FOR STRIP-SHAPED MATERIAL

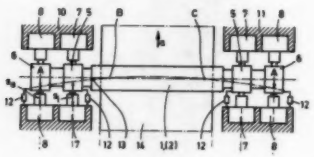
Gerhard Richter, Charlotteenstrasse 5, and Axel Barten, Siegener Strasse 227, both of D-5910 Kreuztal 5, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,070

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431691

Int. Cl.[4] B21B *37/08, 31/32*

U.S. Cl. 72—21 **1 Claim**



1. In a device for regulating the planeness and the thickness of rolled strip in a multiple-roll strip mill stand with work rolls supported on each roll side in an inner mounting member and an outer mounting member, the mounting members being mounted for movement relative to each other horizontally; the improvement comprising means (**12**) for continuously detecting the horizontal position (s_i) of the inner mounting members (**5**) of the rolls (**1, 2**), means (**12**) for continuously detecting the horizontal position (s_o) of the outer mounting members (**6**) of the rolls (**1, 2**), and means (**8**) for moving one of said inner and outer mounting members (**5, 6**) of the rolls (**1, 2**) in a direction and by a distance sufficient to impart to the rolls a horizontal bending line indicated by said detecting means (**12**) to be needed to impart uniform planeness and a desired thickness to the rolled strip.

4,691,549

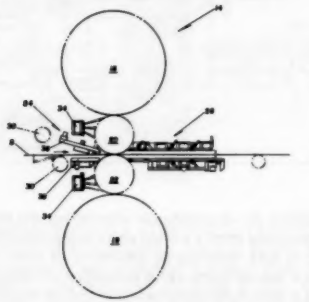
APPARATUS FOR REMOVING LIQUID FROM A STRIP IN A ROLLING MILL AND METHOD THEREOF

James R. Adair, Mt. Lebanon, Pa., assignor to United Engineering Rolling Mills, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 334,192, Dec. 24, 1981, abandoned. This application Nov. 7, 1984, Ser. No. 669,142

Int. Cl.[4] B21B *27/10, 45/02, 9/00*

U.S. Cl. 72—38 **27 Claims**



1. In a strip rolling mill stand having a strip entry and a strip delivery side thereof wherein a strip is reduced in a rolling area between work rolls defining a roll bite and a passline for the strip along which strip travels generally horizontally and a non-rolling area where a gap is created from the edges of said strip outwardly towards the ends of said work rolls, and wherein liquid lubricant applied to said rolls on said entry side tends to accumulate on the upper surface of said strip on the entry side, comprising:

strip guide means on said entry side for guiding said strip between said rolls,

said strip entry guiding means having air pressure means mounted therein which pressure means is located transversely along a portion of said upper surface overlapping the edges of said strip immediately adjacent said roll bite,

said air pressure means includes means associated with said strip constructed and arranged in a manner to prevent at least a substantial amount of said lubricant on said upper surface of said strip on said entry side from entering into said gap and finding its way to the delivery side of said mill stand.

4,691,550

METHOD AND APPARATUS FOR MAKING A PRESSURE HOSE SOCKET

Klaus Dietzel, Herdekamp 8, DE-4232 Xanten, Fed. Rep. of Germany

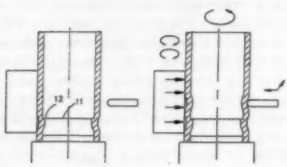
PCT No. PCT/EP85/00441, § 371 Date Mar. 28, 1986, § 102(e) Date Mar. 28, 1986, PCT Pub. No. WO86/01441, PCT Pub. Date Mar. 13, 1986

PCT Filed Sep. 3, 1985, Ser. No. 857,761

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432443

Int. Cl.[4] B21D *15/06, 41/00;* **B21K** *1/16*

U.S. Cl. 72—68 **13 Claims**



1. A process for the production of a pressure hose socket having at least one crown with at least one tooth projecting inward and which points to one end of the socket, said process comprising the steps of pressing a socket from the outside into at least one continuous or interrupted corrugation projecting into the socket and forming at least one elevation of material, and stamping the at least one elevation of material from inside to form the tooth.

4,691,551

ROLLING METHOD AND ROLLING TOOLS

Minoru Haga; Shinobu Kaneko; Shoji Ikawa; Kimimasa Murayama; Yasuhide Nakamura, and Mitsuo Saito, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and OSG Mfg. Company, Hoi, both of, Japan

Filed Jul. 26, 1985, Ser. No. 759,445

Int. Cl.[4] B21H *3/06*

U.S. Cl. 72—88 **8 Claims**

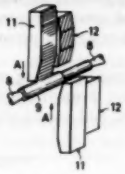
1. A rolling method for simultaneously forming serrations and threads on a workpiece having a first rolling diameter portion on which serrations are to be formed, and a second rolling diameter portion on which threads are to be formed, comprising the steps of:

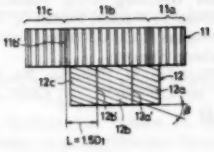
rolling the workpiece; and

during said step of rolling said workpiece first, beginning to

form serrations on the first diameter portion of the workpiece, and

second, forming threads with a lead angle set as a function of a rolling diameter of the first rolling diameter portion of





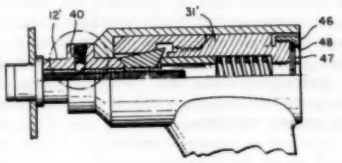
the workpiece, the forming of threads being started after the step of forming serrations has begun and being completed after said forming serrations step is more than half completed and before said forming serrations step is completed.

4,691,552

HEAD FOR BLIND RIVET INSTALLATION TOOLS

Richard B. Peterson, Rte. 1, Box 674, Vashon, Wash. 98070

Filed Jan. 13, 1986, Ser. No. 818,475
Int. Cl.[4] B21J *15/32*
U.S. Cl. 72—391 **4 Claims**



1. The head of a blind rivet installation tool,

said rivet assemblies having shanks with expendable portions thereon,

said shanks with expandable portions having a first length,

said expendable portions having a second length,

said head having a first longitudinal axis and a third length and comprising:

a tip, said tip having a first bore extending therethrough insertion of said shanks, said first bore having a second longitudinal axis, said tip further comprising detent means for retaining said shanks in said first bore,

a casing having a first end, a second end, and a third longitudinal axis,

retention means having a second bore extending therethrough for exit of said expendable portions, said second bore having a fourth longitudinal axis,

said tip being attached to said first end of said casing,

said retention means being installed in said second end of said casing,

said first, second, third and fourth longitudinal axes being essentially coincident,

the sum of said first and second lengths being greater than said third length,

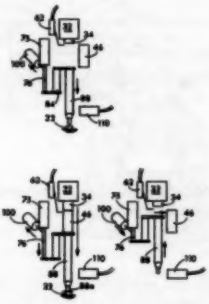
whereby insertion of a rivet assembly into said first bore will cause one of said expendable portions retained in said head to partially exit through said second bore.

4,691,553

SAFETY POWER TOOL

Stephen C. Barber, 18900 Highland Ave., Deephaven, Minn. 55391

Filed Mar. 6, 1986, Ser. No. 836,837
Int. Cl.[4] B21J *7/46*
U.S. Cl. 72—444 **8 Claims**



1. A safety power tool for exerting pressure on a work piece comprising,

a supporting framework having an anvil and a short stroke power ram mounted upon said framework,

a punch supported upon the tool and aligned slideably between the anvil and the short storke power ram, said ram being adapted when extended to move the punch toward the anvil through a relatively short distance, a spacer movable into an opening between the ram and the punch to contact the ram at one end and the punch at the other end when the ram is operated for transmitting the short stroke motion of the ram to the punch and a long stroke retraction actuator for withdrawing the punch from the anvil when the spacer is removed from between the ram and the punch to provide a relatively large cleared space between the punch and the anvil for accommodating and facilitating the introduction and removal of work pieces of various sizes without danger of injury to an operator, said retraction actuator elevating the punch into the space formerly occupied by the spacer when the spacer is in an inoperative position and a lock means mounted upon said apparatus in operative association with said punch, said lock means locking the punch in a fixed position after the punch has been elevated, a timer operatively connected to said lock for energizing the lock so as to halt the motion of the punch after the retraction actuator has raised the punch a predetermined period of time, thereby controlling the height to which the punch is raised when the motion is interrupted by the lock to control the clearance space between the anvil and the punch.

4,691,554

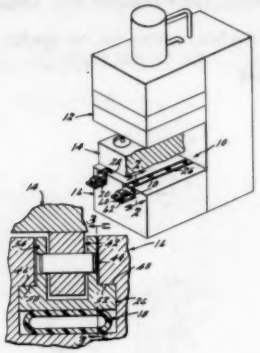
DIE TRANSFER SYSTEM

William P. Murphy, 1067 Kennesaw Ave., Birmingham, Mich. 48008

Filed Jun. 12, 1985, Ser. No. 744,028
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] B30B *15/02;* **B21J** *13/08*
U.S. Cl. 72—448 **1 Claim**

1. The combination of a press having a bolster with a pair of

standard Joint Industrial Counsel T-slots therein and a die transfer system, said die transfer system comprising a pair of elongated, horizontally extending vertically movable rails of inverted T-shaped cross section disposed in said T-slots, respectively, each of said rails having laterally extending flanges at the lower extremity thereof for engagement with a pair of complementary laterally extending shoulders at the upper ends of said T-slots, respectively, a plurality of rollers supported by



each of said rails and movable vertically therewith, a pair of air bags extending longitudinally of each of said T-slots under said rails, respectively, and engageable with the bottoms thereof, inflation of said air bags effecting vertical movement of said rails and rollers in translation into engagement with the bottom of said die and elevation of said die relative to said bolster, the flanges on said rails being engageable with the shoulders on said T-slots to limit upward movement of said rails and distortion thereof.

4,691,555

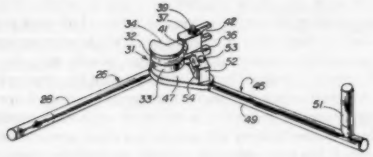
TUBE BENDING TOOL

Donald R. Vaughan, 880 N. East St., Woodland, Calif. 95695

Continuation of Ser. No. 671,882, Nov. 15, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 854,186

Int. Cl.[4] B21J *13/08*

U.S. Cl. 72—459 **11 Claims**



1. A tube bender for use with a tube having a given external radius comprising

a block having a peripheral edge face which is cylindrical about a first axis of rotation, said block being formed with an arcuate first semi-circular cross-section tube-receiving groove recessed into said edge face, said first axis being the center of said arcuate groove,

a retainer, support means mounting said retainer a fixed distance from said block, said retainer having an end formed with a straight second semi-circular cross-section tube-receiving groove, said first and second grooves generally facing toward each other,

a forming member having a shoe formed with a third semi-circular cross-section tube-receiving groove, means detachably mounting said forming member on said block for rotative movement about said first axis,

said first, second and third grooves lying in a common plane perpendicular to said first axis and also all having the same radius of curvature approximately equal to the external radius of the tube to be formed,

said retainer and said shoe each being positionable with said second and third grooves aligned along a common second axis lying in said common plane, the centers of curvature for said second and third grooves lying on said second axis,

said retainer and said shoe lying on opposite sides of a second plane passing through said first axis perpendicular to said second axis, said second plane intersecting said second groove.

4,691,556

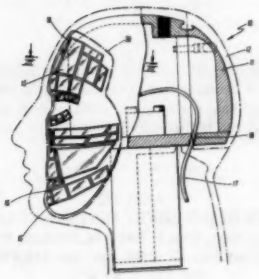
LOAD-SENSING FACEFORM FOR CRASH DUMMY INSTRUMENTATION

Hugo Mellander, Göteborg; Stefan Nilsson, Marstrand, both of Sweden; Charles Y. Warner; Milton G. Wille, both of Provo, Utah, and Magnus Koch, Göteborg, Sweden, assignors to AB Volvo, Göteborg, Sweden

Filed Jan. 31, 1986, Ser. No. 824,666

Int. Cl.[4] G01N *3/30*; **G01L** *25/00*

U.S. Cl. 73—12 **10 Claims**



1. A test dummy head for measuring the effects of impact force and pressure applied thereto, said head comprising a skull forming a face, a plurality of thin pressure-sensitive piezoelectric films attached to said face, said films providing eletrical signals representative of a time history of pressure applied to said face, said face containing individually machined surfaces sized to receive said films.

4,691,557

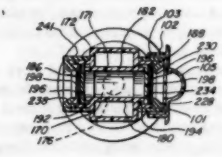
ACOUSTIC COUPLING ASSEMBLY WITH RETAINING CONNECTOR FOR NONINVASIVE SENSING OF SAMPLING CHAMBER FLUID

William J. Dunn, Libertyville, and Brian H. Silver, Hoffman Estates, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed May 6, 1985, Ser. No. 731,094

Int. Cl.[4] G01N *9/00*

U.S. Cl. 73—32 A **15 Claims**



1. In a fluid sampling chamber assembly for noninvasive

sensing of the fluid having a chamber with a sensor wall arrangement for acoustic coupling therewith, apparatus for coupling a transducer of a transducer assembly with each sensor wall of said sensor wall arrangement, comprising:

means located adjacent the sensor wall for enhancing good acoustic coupling of the sensor wall with the transducer;

a relatively rigid connector member mounted to the chamber around the sensor wall, said connector member having an access opening means for coupling engagement therethrough of the transducer with the sensor wall; and

an annular portion of the access opening means being in retentive overlying relationship with said acoustic coupling enhancing means;

said acoustic coupling enhancing means including a fluid like coupling agent for eliminating air gaps;

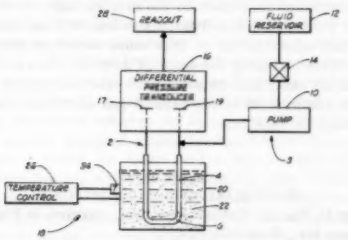
said transducer assembly supporting said sampling chamber by each of said connector members when said transducer assembly is received within said access opening.

4,691,558

PRESSURE PULSE GELATION TEST APPARATUS AND METHOD

Edward F. Vinson, Duncan, and William H. Smith, Walters, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 19, 1986, Ser. No. 876,969
Int. Cl.[4] G01N *11/00*
U.S. Cl. 73—64.1 **25 Claims**



1. An apparatus for testing gelation of a sample comprising:

fluid circuit means, having a closeable internal volume, for receiving the sample within said internal volume;

pressurizing means, including means for creating pressure pulses within said internal volume on one side of the sample, connected into said fluid circuit means, for changing the pressure within said internal volume; and

pressure detecting means, connected into said fluid circuit means, for detecting a pressure differential across the sample in said internal volume in response to said pressurizing means when said internal volume is closed.

4,691,559

DEVICE FOR MEASURING THE PROPERTIES OF SOLID MATERIALS WHICH CAN BE DERIVED FROM THE BEHAVIOR OF A PENETRATING BODY

Helmut Fischer, Industriestrasse 21, 7032 Sindelfingen-Maichingen, Bundesrepublik, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,430
Int. Cl.[4] G01N *3/48*
U.S. Cl. 73—81 **45 Claims**

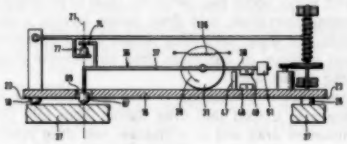
1. In an apparatus for nondestructive, absolute measurement of the properties of solid materials which is derived from the behavior of a body penetrating said materials, having a penetrating body, a guidance device for guiding said penetrating body in a direction of motion onto said materials, and an electrical evaluation circuit, the improvement comprising:

(a) an electromotive drive connected to said guidance device that urges said penetrating body with a specific, but variable force onto the surface of said materials,

(b) means for feeding a first voltage output representing said force to said electrical evaluation circuit,

(c) a floating distance-measuring device having first and second sections which allows measurements of the distance between said first and second sections in said direction of motion of said penetrating body and has a resolution that is significantly smaller than the depth of penetration of said penetrating body,

(d) said first section being rigidly connected to said penetrating body,



(e) a follower connected to said second section to guide said penetrating body, through said first section, bounce-free onto the surface of said material,

(f) means for finely moving said follower in said direction of motion of said penetrating body, said means switching off after said penetrating body has been set down onto said material and when said distance-measuring device measures a prespecified distance between said first and second sections, and

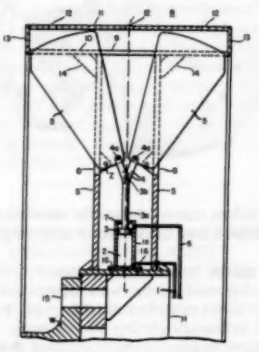
(g) means for feeding a second voltage output representing the depth of penetration from said distance measuring device to said electrical evaluation circuit.

4,691,560

METHOD AND APPARATUS FOR THE PERFORMANCE TESTING OF THE ENGINE OF A SHIP WHILE THE ENGINE IS INSTALLED IN THE HULL OF A SHIP

Wilheim Otto, Seevetal, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,278
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444164
Int. Cl.[4] G01L *5/13*
U.S. Cl. 73—116 **20 Claims**



1. Apparatus for performance loading of an engine of a deepwater ship having a hull and a propeller shaft extending from said hull, said apparatus for testing the performance of said engine when said engine is installed in said hull of said ship

and when said propeller shaft is surrounded by water, said apparatus comprising:

a hub portion for being mounted on said propeller shaft of said ship at a position on said propeller shaft substantially where a propeller of said ship is mounted during operation of said ship on a body of water when said propeller is driven by said propeller shaft;

drag means for producing a drag when said hub is rotating and driven by said propeller shaft, said drag means being firmly attached to said hub, said hub driving said drag means through said water about said propeller shaft when rotated by said propeller shaft;

said drag means having at least one surface which interacts with water about said propeller shaft to produce said drag during operation, said drag means having a position of minimum drag, said drag means being extendable from said position of minimum drag to increase drag of said drag means; and

control means connected to and for adjusting said drag means to extend said drag means from said position of minimum drag and to withdraw said drag means to said position of minimum drag, thereby to increase and decrease drag respectively of said drag means during operation and to load said engine of said ship even when said ship is substantially stationary;

said at least one surface being disposed in operation to produce substantially, solely, a torque about said propeller shaft;

said at least one surface arranged for substantially reducing any thrust on said propeller shaft developed by said apparatus to a minimum;

said control means for adjusting said drag means to selectively increase and decrease torque on said propeller shaft and thereby to selectively vary the load on said engine during operation.

4,691,561

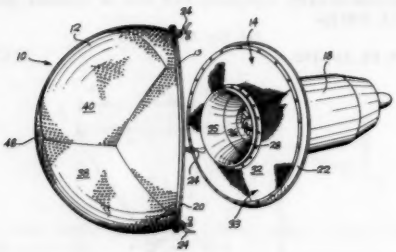
INFLOW CONTROL DEVICE FOR ENGINE TESTING

Ulrich W. Ganz, Kirkland, and Paul C. Topness, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 13, 1986, Ser. No. 873,818

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.1 **10 Claims**



1. An air inflow control device for simulating flight-like air inflow conditions into the intake of a jet engine or the like, comprising:

a hollow sphere truncated in a manner defining a circular opening into said sphere, with the sidewall of said sphere being pervious to airflow therethrough; and

a circular bellmouth closing said opening, said bellmouth including a recessed portion, a sound-absorbing material received in said recessed portion, and a layer of perforated material covering said sound-absorbing material, with said recessed portion, said sound-absorbing material and said perforated material together forming an inwardly projecting surface having a generally conical taper from near the bellmouth's outer radial edge to a central high-lite portion of said bellmouth, said high-lite portion providing an air inlet from inside said sphere to said jet engine, and wherein said high-lite portion is mated to said engine intake in a manner such that said high-lite portion inlet and said engine intake form a smooth and continuous intake from inside said sphere to said engine.

4,691,562

PROCESS FOR DETERMINING AGING CONDITION OF EXHAUST-GAS CATALYST

Joerg Abthoff, Pluederhausen; Hans D. Schuster, Schorndorf; Hans J. Langer, Remseck; Wolfgang Zahn, Stuttgart, and Günther Ebinger, Heiningen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 30, 1986, Ser. No. 890,540

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527175

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 **9 Claims**

4. A process for determining the condition of an exhaust-gas catalyst for an internal combustion engine which has a λ-probe for λ-controlled regulation of the fuel/air ratio, in which the fuel/air ratio is switched from rich to lean or from lean to rich when said ratio exceeds or falls below a pre-specified value, said process including the steps of delaying the switching of the fuel/air ratio, and measuring the relative amount of combustible components in the exhaust gas after the exhaust gas has passed the catalyst.

4,691,563

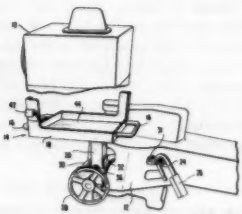
RAILROAD COUPLER MOUNT

Gregory C. Martin, Gaithersburg, Md., assignor to Pulse Electronics, Inc., Rockville, Md.

Filed Nov. 25, 1986, Ser. No. 934,922

Int. Cl.[4] G01L *5/00, 5/28*

U.S. Cl. 73—129 **9 Claims**



1. A railroad coupler mount for securing signalling and monitoring equipment to a knuckle of a railroad car coupler, comprising:

a banana shaped member which extends through a pair of relief holes on a common horizontal axis in said knuckle of said railroad car coupler, said banana shaped member having an end with an aperture to receive a bracing member;

support means for supporting said signalling and monitoring equipment and slidably receiving said banana shaped member at end opposite the apertured end; and

tightening means for partially withdrawing said banana shaped member from said relief holes against the resis-

tance of said bracing member to force said support means against a side wall of said railroad car coupler.

4,691,564

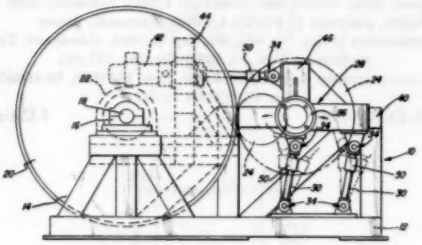
HIGH SPEED TIRE UNIFORMITY TESTING DEVICE

Gerald R. Potts, Flint, Mich., and John C. Ryder, Massillon, Ohio, assignors to G. R. Potts Associates, Inc., Flint, Mich.

Filed Jul. 1, 1986, Ser. No. 880,759

Int. Cl.[4] G01M *17/02*

U.S. Cl. 73—146 **4 Claims**



1. An apparatus for testing tires at high speed comprising:

a rotatable wheel mounted on an axle, means for supporting said wheel on a frame, and means operatively connected to said axle for driving said wheel;

a tire mounting means connected to a housing for rotatably mounting a test tire and a linear actuator connected to said housing by means of a universal joint for moving said housing and test tire toward and away from said wheel;

said housing connected to said frame by means of first and second tie rod members with said first tie rod member being connected between the frame and the underside of said housing and said second tie rod member being connected between the frame and a side of said housing wherein the angle formed between the axes of said first and second members being substantially 90 degrees; and

said tie rod members connected to said housing and said frame by means of universal joints whereby only tension and compression forces are applied to said members when said test tire is rotatably engaged against said wheel.

4,691,565

MOBILE MACHINE FOR MEASURING TRACK PARAMETERS

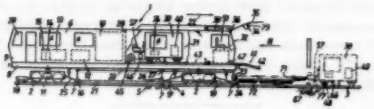
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 16, 1986, Ser. No. 863,884

Claims priority, application European Pat. Off., Aug. 22, 1985, 85890188.7

Int. Cl.[4] G01B *5/20*

U.S. Cl. 73—146 **12 Claims**



1. A mobile machine for measuring the position of a track and arranged for mobility on the track in an operating direction, which comprises

(a) a machine frame having a front end in the operating direction,

(b) track reference measuring systems on the machine frame for determining different track parameters including the vertical and lateral position of the track, the track reference measuring systems for determining the vertical and lateral track position including

(1) a laser beam receiver means on the machine frame front end, and

(c) a self-propelled satellite bogie preceding the machine frame front end in the operating direction for mobility on an uncorrected section of the track in said direction, the bogie being equipped with

(1) a drive for propelling the bogie in said direction and

(2) a laser beam emitter means emitting a laser beam extending in at least one plane and projecting the laser beam on the receiver means for continuously determining any deviations in an extended uncorrected track section from a desired one of said positions,

(d) the front end of the machine frame being arranged for receiving the satellite bogie and having a storage station whereinto, and wherefrom, the satellite bogie may be propelled, and

(e) the satellite bogie being constructed for being automatically propelled into, and from, the storage station and the front end of the machine frame.

4,691,566

IMMERSED THERMAL FLUID FLOW SENSOR

Harry E. Aine, 30600 Page Mill Rd., Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 666,040, Dec. 7, 1984, abandoned. This application Aug. 15, 1985, Ser. No. 765,839

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **27 Claims**

1. In a method for sensing fluid flow in a fluid passageway for containing the flow to be measured, the steps of:

supporting a temperature dependent flexible sensing resistor on a flexible ribbon-shaped flow septum for immersion in said fluid passageway;

immersing and meandering by flexure both said ribbon-shaped septum and sensing resistor within said fluid flow passageway so as to partition a preponderance of the flow therein into a plurality of side-by-side flow portions, each with a length, L, at least three times larger than its characteristic minimum cross-sectional dimension, D and each partitioned flow portion being disposed in heat-exchanging relation with said meandered sensing resistor; and

deriving an electrical output signal from said meandered and flexed sensing resistor which is a function of the fluid flow for sensing the fluid flow.

4,691,567

APPARATUS FOR DETERMINATION OF THE STATIC UNBALANCE IN A BODY

Günther Himmler, Darmstadt, and Günter Knoll, Büttelborn, both of Fed. Rep. of Germany, assignors to Gebr. Hofmann GmbH & Co. KG. Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Continuation of Ser. No. 643,696, Aug. 24, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 903,869

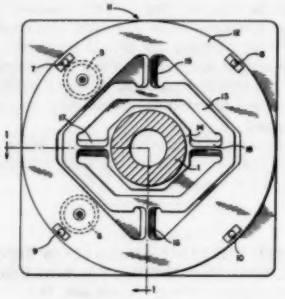
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330974

Int. Cl.[4] G01M *1/12*

U.S. Cl. 73—483 **2 Claims**

1. Apparatus for determination of the static unbalance in a

body, said apparatus comprising: an adaptor plate for supporting the body to be balanced, a gimbal support for the adaptor plate and having two mutually perpendicular axes of rotation defining two degrees of freedom, said gimbal support counteracting the forces exerted by the unbalance, the axes of rotation of said gimbal support defined by axially rigid torsion members that can deflect torsionally about their own axes, said gimbal support provided as a single, undetachable unit including an outer body, a middle body, and an inner body wherein two twistable torsion members extend between and interconnect



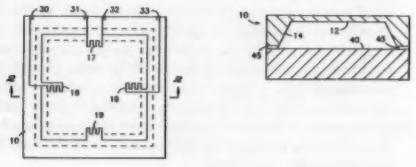
the outer and the middle bodies and another two twistable torsion members extend between and interconnect the middle and inner bodies, the axes of twist of said twistable torsion members lying in a single plane, said torsion members being rigid in both the vertical and the horizontal direction to transmit radial and axial forces exerted thereon, said torsion members having a substantailly square cross section defined by four longitudinally extending sides that meet to define two pairs of opposed longitudinally extending edges, one pair of opposed, edges lying in a substantially vertical plane and another pair of opposed edges lying in a substantially horizontal plane.

4,691,568

SEMI-CONDUCTOR ACCELEROMETER

Peter M. Rendek, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 9, 1985, Ser. No. 806,919
Int. Cl.[4] G01P *15/12*
U.S. Cl. 73—517 R **10 Claims**



1. An accelerometer comprising:

a substantially square diaphragm formed of monocrystaline silicon with opposed major surfaces and having four edges defined by a relatively thick frame member integrally affixed thereto;

a serpentine resistor diffused into one of the major surfaces of said diaphragm adjacent each edge and centered approximately on a bisector of the edge with two resistors being oriented parallel to the adjacent edges and two resistors being oriented perpendicular to the adjacent edges; said resistors being electrically connected into a Wheatstone bridge configuration;

a base member having a relatively flat surface, said frame member being positioned on the flat surface and fixedly attached thereto with said diaphragm being substantially parallel to the flat surface and spaced therefrom, said frame member fixedly anchoring each edge of said diaphragm to said base member to prevent relative movement thereof; and

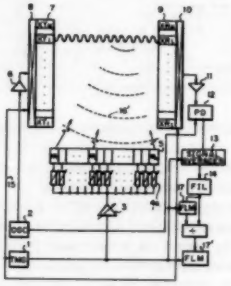
vent means formed in one of said frame member and said base member to prevent the occurrence of differential pressure on the opposed major surfaces of said diaphragm.

4,691,569

APPARATUS FOR OBSERVING SOUND FIELD OF ULTRASONIC WAVE

Takuso Sato, Tokyo, and Nobuyuki Ichida, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 647,389, Sep. 5, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 931,981
Claims priority, application Japan, Sep. 13, 1983, 58-168600
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—596 **7 Claims**



1. An apparatus for observing a sound field of an ultrasonic wave, comprising:

first means for determining a first parameter value of a medium at each point in a predetermined region using a first ultrasonic wave having a sound field of an arbitrary shape transmitted into the medium, the first parameter value being an equivalent second-order acoustic nonlinearity parameter which characterizes the nonlinear relationship between pressure and density in a medium;

second means for displaying the output of said first means as one of a two-dimensional and a three-dimensional picture of said predetermined region, thereby displaying the shape of the sound field of said first ultrasonic wave;

third means for determining a second parameter value of the medium at each point in said predetermined region using a second ultrasonic wave having a sound field uniform over said predetermined region of the ultrasonic wave field transmitted into the medium, the second parameter value being substantially the same as the first parameter value; and

fourth means for determining a ratio of the first and second parameter values of the medium at each point therein obtained from said first and third means, the output of said fourth means being supplied to said second means and displayed thereby.

4,691,570

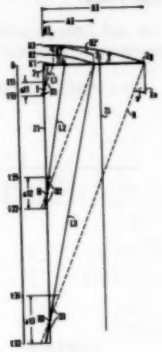
METHOD AND APPARATUS FOR ULTRASONICALLY SCANNING A SUBJECT WITH AN ULTRASOUND HEAD

Dietrich Hassler, Flurweg 3, 8525 Uttenreuth, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,313
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—626 **18 Claims**

1. A method for ultrasonically scanning an object at a se-

lected number of different depth regions along a straight scan line in a direction of increasing depth using an ultrasound head having a plurality of ultrasonic transducer elements, wherein a predetermined number of said transducer elements is activated, thereby forming an ultrasound aperture during reception along said scan line, and wherein echo signals received from said object are successively processed, said method, during reception along said scan line, comprising the steps of:



enlarging the ultrasound aperture in steps, thereby moving the center of said aperture in a scan direction from a fixed starting point;

adjusting the directional characteristic of said aperture at each of said steps; and

selecting a different depth region at each of said steps, thereby generating a sawtooth scan curve approximating said straight scan line.

4,691,571

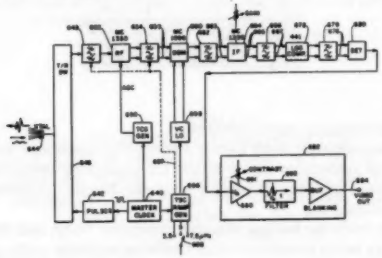
TISSUE SIGNATURE TRACKING TRANSCEIVER HAVING UPCONVERTED IF AMPLIFICATION

Terrance Matzuk, Verona, Pa., assignor to Dymax Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 707,584, Mar. 4, 1985, abandoned. This application Sep. 3, 1986, Ser. No. 902,140

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—632 **14 Claims**



1. For use with an ultrasound transducer, a selected bandwidth ultrasound transceiver comprising:

means for generating an ultrasound signal having a selected amplitude and frequency;

means for energizing said transducer for signal propagation of said ultrasound signal through a medium, wherein said transducer provides a reflected signal upon receipt of a reflection of said propagated signal; and

means for receiving said reflected signal, comprising:

superheterodyne receiver means for continuously selecting different frequency components from among the signal frequency components of said reflected signal according to the depth of the received reflected signal, providing an output signal by modulating the local oscillator frequency according to said selected different signal frequency components, wherein

said detector means output signal describes the reflective characteristics within said medium, the amplitude variations and relative time intervals providing indication of medium reflectivity at corresponding medium depths.

4,691,572

TRANSDUCING DEVICE FOR CONTACTLESS ULTRASONIC INSPECTION OF PIPELINES OR TUBINGS

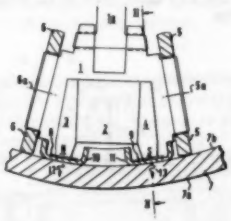
Wilhemus H. van den Berg; Marinus H. Homs, both of Amsterdam, Netherlands, and Bob P. J. van Oorschot, Aberdeen, United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 8, 1985, Ser. No. 763,845

Claims priority, application United Kingdom, Aug. 9, 1984, 8420244

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—643 **17 Claims**



1. A transducing device for contactless ultrasonic inspection of a conductive plate material, comprising:

means for electromagnetically generating focused transverse elastic waves within said plate material to be inspected effective to drive said elastic waves through the plate material causing reflections of the elastic waves from the rear side of the plate material; and

means for mounting and moving said means for generating along said material.

4,691,573

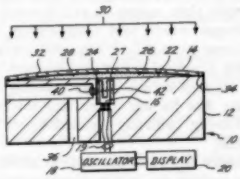
PRESSURE SENSOR

Gerald F. Varnum, Georgetown, Tex., and Christopher C. Duke, Lone Wolf, Okla., assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Filed Jun. 16, 1986, Ser. No. 874,410

Int. Cl.[4] G01L *7/08, 11/00*

U.S. Cl. 73—702 **3 Claims**



1. A fluid filled pressure transducer for measuring the pressure of an external fluid comprising:

a sensor body having a substantially planar backup surface;

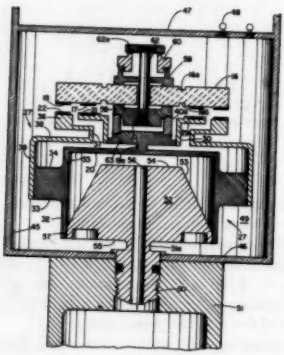
a flexible diaphragm having a radially outer portion in sealed relationship with the backup surface of the sensor body;
a variable volume fluid chamber defined by the backup surface and the diaphragm;
a sensor chamber formed in the sensor body and in fluid communication with the variable volume fluid chamber;
a pressurized, compressible working fluid contained in the fluid and sensor chambers;
means mounted in the sensor chamber for sensing variations in the density of the working fluid within the sensor chamber;
an enclosure cover attached to the sensor body and enclosing the flexible diaphragm;
an isolation diaphragm having a radially outer portion secured to said enclosure cover, said isolation diaphragm and enclosure cover forming a isolation chamber in fluid communication with said flexible diaphragm; and
a substantially incompressible isolation fluid contained in the isolation chamber whereby pressure exerted upon the isolation diaphragm is communicated by said isolation fluid to said flexible diaphragm.

4,691,574

CAPACITANCE TRANSDUCER

Leroy C. Delatorre, 11 Crestwood, Sugar Land, Tex. 77478

Filed Feb. 25, 1986, Ser. No. 832,736
Int. Cl.[4] G01L *7/08, 9/12, 19/04*
U.S. Cl. 73—708 **9 Claims**



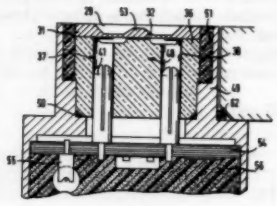
1. A capacitance type pressure transducer for converting fluid pressure into electrical signals representative of a magnitude of pressure, comprising:
housing means having a pressure measuring chamber with an input orifice for receiving a pressure input to be measured and with a flexible diaphragm for displacement with respect to a first axis as a function of pressure where said first axis is transverse with respect to said diaphragm;
first inner and outer support means in said housing means for respectively supporting first inner and first outer annular electrode plate means on said housing means and on said diaphragm where said plate means are in a first plane transverse to said first axis, said inner support means including a central cylindrical support member;
second support means in said housing means including an annular disc having upper and lower surfaces, and said disc having centrally located upper and lower bearing surfaces;
second inner and outer annular electrode plate means on said lower surface in a second plane transverse to said first axis and in a facing and spaced relationship to said first inner and first outer annular electrode plate means; and
interconnecting means for interconnecting said first inner support means and said second support means to one another including an annular temperature compensating ring means attached to said central cylindrical member, a lower support ring attached to said ring means and bearing on a lower bearing surface of said second support means, an upper annular support ring bearing on an upper bearing surface of said second support means, and rod member means extendable through openings in said upper annular support ring, said annular disc for interconnecting said upper annular support ring and said annular disc to said lower support ring.

4,691,575

TRANSDUCER INSERTS; METHODS OF MAKING THEM AND SENSORS FOR MEASURING MECHANICAL VARIABLES

Hans-Conrad Sonderegger, Neftenbach; Reto Calderara, Winterthur; Alfred Wenger, Winterthur, and Hans-Ulrich Baumgartner, Winterthur, all of Switzerland, assignors to Kristal Instrumente AG, Winterthur, Switzerland

Filed Dec. 30, 1985, Ser. No. 814,401
Claims priority, application European Pat. Off., Jan. 28, 1985, 85100818.5
Int. Cl.[4] G01L *7/08, 9/06, 9/12*
U.S. Cl. 73—756 **19 Claims**



1. A transducer insert comprising:
a semi-conductor body having a measuring diaphragm with force responsive sensor means for generating measuring signals, said semi-conductor body also having connecting contacts;
a base body for holding the semi-conductor body, said base body being composed of an insulating material; and
electrical conductor means for carrying off said measuring signals, said conductor means comprises channels which extend through said base body and are provided with electrically conductive layers, said electrically conductive layers extend close to the connecting contacts to permit associated ones of said electrically conductive layers and said connecting contacts to be electrically connected to each other through an electrically conductive material, said electrically conductive material being applied adjacent to portions of the associated ones of said conductive layers and connecting contacts in an angle space therebetween.

4,691,576

METHOD OF TESTING THE MECHANICAL STRESS RESISTANCE OF A SAMPLE OF MATERIAL AND APPARATUS FOR CARRYING OUT THE METHOD

Kurt Schleuniger, Nennigkofen, and Peter Hermann, Brügg bei Biel, both of Switzerland, assignors to Strausak AG, Switzerland

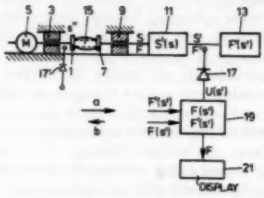
PCT No. PCT/CH85/00036, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/04247, PCT Pub. Date Sep. 26, 1985

PCT Filed Mar. 1, 1985, Ser. No. 801,685

Claims priority, application Switzerland, Mar. 21, 1984, 1416/84

Int. Cl.[4] G01N *3/00*

U.S. Cl. 73—821 **28 Claims**



1. A method of testing the mechanical resistance of a sample of material comprising the steps of:

(a) positioning said sample on a path of motion of two pressing jaws which are movable relative to each other, both towards and away from each other, when said jaws are apart from each other;

(b) moving at least one of said two jaws so as to bring said two jaws relatively closer to each other and thereby bring both of said two jaws into contact with said sample;

(c) automatically controlling the speed of said jaws relative to each other, from a high speed at the beginning of said moving, to a low speed just before both of said two jaws have made contact with said sample, to minimize the contact impact of said jaws and said sample and to simultaneously minimize the approach time of said jaws to said sample;

(d) pressing said two jaws together with said sample therebetween; and

(e) registering a pressing force and mechanical deformation of said sample.

4,691,577

SOAP FILM GAS FLOWMETER

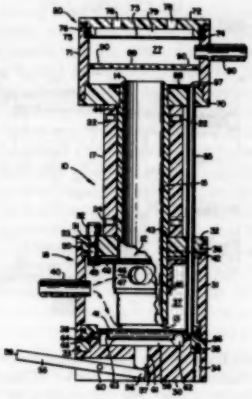
Hill S. Lalin, 10 Bonita Ter., Wayne, N.J. 07470; Jorge E. Bermudez, 55 Ave. B, Haledon, N.J. 07508, and William T. Fleming, 286 Green Village Rd., Green Village, N.J. 07935

Filed Mar. 10, 1986, Ser. No. 837,847

Int. Cl.[4] G01F *1/708, 25/00*

U.S. Cl. 73—861.05 **22 Claims**

1. A soap film gas flowmeter comprising: a flow tube having a hollow body with opposite open ends through which a soap film is propelled, a first closed chamber housing a soap solution; means for supporting said flow tube in a substantially vertical position with the open bottom end of the flow tube disposed in said first chamber above said soap solution; a second closed chamber into which the open top end of said flow tube extends; gas inlet means for introducing gas into said first chamber at a flow rate to be measured using the flowmeter; gas exit means for discharging the gas introduced into said first chamber through said second chamber; means for generating a single soap bubble from said soap solution substantially at the bottom end of said flow tube and a relatively large opening in said flowtube for providing an open passageway for inlet gas to



pass through said flowtube when said bottom open end of said flowtube is covered by said soap solution.

4,691,578

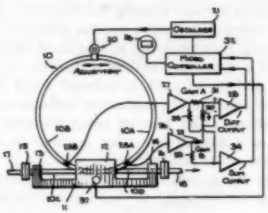
CORIOLIS-TYPE MASS FLOWMETER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Feb. 21, 1986, Ser. No. 831,564

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **8 Claims**



1. A mass flowmeter of the Coriolis type comprising:

A. a single turn flow loop formed by a pipe having a pair of arcuate legs, said loop being supported on a frame whereby the loop is free to vibrate at its natural resonance frequency;

B. a self-sufficient electromagnetic ballistic vibrator mounted on said loop at the vertex thereof, said vibrator having a mass therein that oscillates to cause the loop to vibrate at its resonance frequency;

C. means to feed a fluid to be metered through said vibrating loop to cause said loop to undergo tortional oscillation as a function of mass flow:

D. a pair of strain gauges mounted on the respective legs of said loop whereby in the absence of flow, the gauges yield equal signals and during flow they yield signals of different magnitude as a function of mass flow;

E. means to apply the signals from the gauges to a differential amplifier whose output is substantially proportional to the mass flow rate; and

F. means responsive to the differential amplifier output to provide a mass flow rate reading.

4,691,579

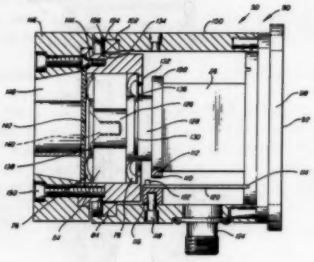
TENSION TRANSDUCER

Kenneth E. Ekola, 574 - 6th St., Dover, N.H. 03820

Filed Jun. 3, 1986, Ser. No. 870,113

Int. Cl.[4] G01L *5/10*

U.S. Cl. 73—862.48 **11 Claims**



1. In a transducer of the cantilevered beam type wherein a force to be measured is applied perpendicularly to the end of the beam through a joint, the improved joint comprising:

(a) a self-aligning first roller bearing having an axially aligned center bore and a cylindrical outer surface;

(b) a cylindrical inner member carried by the end of the beam adapted to receive said center bore as a snug fit thereof;

(c) a cylindrical outer member having cylindrical inner and outer surfaces, said cylindrical inner surface being of a diameter to be a sliding fit about said cylindrical outer surface of said first roller bearing, said cylindrical inner surface also having parallel, spaced, inward-facing ridges thereon of a spacing greater than the width of the said first roller bearing, said cylindrical outer member further including means for receiving a force to be measured;

(d) bias means disposed between said inward-facing ridges and said first roller bearing for resiliently urging said first roller bearing towards a neutral position;

(e) a second roller bearing having an axially aligned center bore of a radius larger than the radius of said cylindrical outer surface of said cylindrical outer member by an amount equal to the maximum deflection to be allowed, said second roller bearing being disposed concentrically about said cylindrical outer member in alignment with said first roller bearing; and,

(f) means for non-movably supporting said second roller bearing with respect to the support of the cantilevered beam.

4,691,580

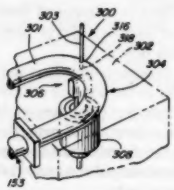
FLUID SAMPLING APPARATUS

Egil Fosslien, 1499 Shermer Rd., Northbrook, Ill. 60062, assignor to Egil Fosslien, Northbrook, Ill.

Filed Jan. 8, 1986, Ser. No. 817,077

Int. Cl.[4] G01N *1/14, 35/08*

U.S. Cl. 73—864.84 **20 Claims**



17. In combination in an apparatus for sequentially withdrawing a blood sample from a sample container which is part of a plurality of sample containers or withdrawing blood from individual containers in a manual mode, transporting the sample to an analyzer and then analyzing the sample in the analyzer:

a T-valve between the sample container and the analyzer, the T-valve comprising

a resilient conduit having an exterior wall, a longitudinal axis and an interior passage, the interior passage adapted to have blood flowing therethrough and being defined by an interior wall of the resilient conduit;

a rigid second conduit from the resilient conduit to the analyzer to transport blood samples from the resilient conduit to the analyzer, the second conduit having at least two orifices, a longitudinal axis substantially transverse to the longitudinal axis of the resilient conduit and an interior passage adapted to have blood flow therethrough, the second conduit extending through the exterior wall of the resilient conduit and having at least one orifice in the interior passage of the resilient conduit;

means for periodically deforming the interior wall of the resilient conduit into sealing engagement with the orifice of the second conduit in the interior passage of the resilient conduit to sequentially separate and transport blood samples from the resilient conduit to the analyzer, the deforming means being exterior to the resilient conduit and including a pinch member opposite the orifice in the interior passage of the resilient conduit and means for actuating the pinch member to abuttingly engage and deform said exterior wall to sealingly engage the interior wall against the orifice in the interior passage with the resilient tube retaining an interior passage of reduced cross-section for blood flow therein; and

a sliding analyzer valve between the T-valve and the analyzer, the analyzer valve comprising

a housing;

a longitudinal channel through the housing;

a sliding member extending through the channel in the housing for reciprocating movement therein, the sliding member having at least two channels which are generally normal to the longitudinal channel and which extend through the sliding member;

a valve seat which abuttingly engages the sliding member generally normal to the sliding member, the seat including at least one longitudinal channel which provides a generally straight fluid flow through the valve when it is aligned with one of the channels in the sliding member upon reciprocating movement thereof; and

a means for actuating the sliding member for reciprocating movement so as to put the analyzer in fluid communication with the T-valve or a sample container in the manual mode.

4,691,581

GEARMOTOR FOR THE ALTERNATE DRIVE OF TWO OPERATIONS

Jacques Bascou, Maule, France, assignor to Regie Nationale des Usines Renault, Paris, France

Filed Dec. 5, 1985, Ser. No. 804,768

Int. Cl.[4] F16H *19/04;* **E05F** *11/48*

U.S. Cl. 74—30 **6 Claims**

1. A gearmotor for the alternate drive of two operations, comprising:

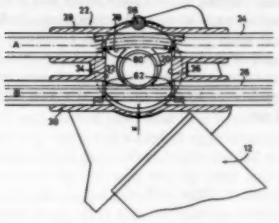
a housing;

a drive pinion rotatably mounted in said housing;

first and second substantially parallel rack cables extending through said housing in a first direction perpendicular to an axis of rotation of said drive pinion and on respectively opposite sides of drive pinion;

sliding guide means for guiding said first and second rack cables, said sliding guide means being movable in said housing only in a second direction perpendicular to said axis of rotation and to said first direction by an amount

sufficient for said drive pinion to alternately engage one of said first and second rack cables; and



means for moving said sliding guide means comprising sliding guide means actuator means, and an actuating pin fixed to said sliding guide means, said pin extending outside of said housing and engaging said actuator means.

4,691,582

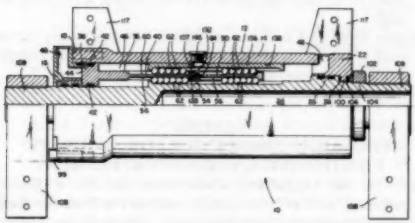
THIN PROFILE ROTARY ACTUATOR WITH BACKLASH ELIMINATION

Paul P. Weyer, 48811 284th SE., Enumclaw, Wash. 98022

Continuation-in-part of Ser. No. 575,228, Jan. 30, 1984, Pat. No. 4,590,816, and Ser. No. 692,293, Jan. 17, 1985, Pat. No. 4,683,767. This application Dec. 2, 1985, Ser. No. 803,954

Int. Cl.[4] F16H *55/18, 1/18*

U.S. Cl. 74—409 **47 Claims**



1. A fluid-powered actuator, comprising:

a body;

a rotatable member supported for rotation relative to said body and connectable to an external device;

a first member reciprocally mounted within said body;

a second member reciprocally mounted within said body generally coaxial with said first member, said first and second members being independently and adjustably rotatable and axially movable within at least a limited range relative to the other without directly producing axial or rotational movement of the other;

at least one piston reciprocally mounted within said body for application of fluid pressure to one or the other opposing sides thereof to produce axial movement of said piston, said piston operatively engaging at least one or the other of said first and second members to axially move said members in response to axial movement of said piston;

first torque-transmitting means for transmitting torque between said first member and said body;

second torque-transmitting means for transmitting torque between said first member and said rotatable member;

third torque-transmitting means for transmitting torque between said second member and said rotatable member;

fourth torque-transmitting means for transmitting torque between said second member and said body, at least said first and fourth torque-transmitting means or said second and third torque-transmitting means producing relative rotational movement between said body and said rotatable member in response to axial movement of said piston, and said first, second, third and fourth torque-transmitting means producing movement of said first and second members in unison and in the same axial direction with substantially equal axial travel in response to axial movement of said piston during fluid powered operation; and

a collar threadably connected to said first member and applying an adjustable and oppositely directed axial force on said first and second members to selectively axially move at least one of said first or second members relative to the other while allowing at least one of said first or second members to move axially and rotationally independent of the other in response thereto within said limited range by an amount sufficient to axially preload said first and second members with respect to said first, second, third and fourth torque-transmitting means with a desired force, said collar operatively engaging said first and second members to maintain said first and second members in fixed axial position relative to each other during fluid powered operation once so adjusted for preloading to substantially eliminate backlash in said first, second, third and fourth torque-transmitting means as said piston moves from one axial direction to the other to produce relative rotational movement between said body and said rotatable member in response to selective application of fluid pressure to said piston.

4,691,583

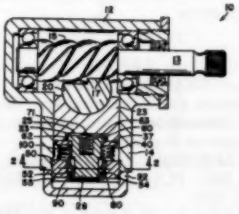
SELF-ADJUSTING RACK SUPPORT

Alistair G. Taig, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 27, 1986, Ser. No. 845,208

Int. Cl.[4] B62D *3/12*

U.S. Cl. 74—422 **13 Claims**



1. In a rack and pinion assembly, comprising a housing receiving therein a pinion, a rack disposed within said housing and having teeth in meshing engagement with pinion teeth, a support yoke engaging and supporting said rack for engagement with said pinion, and resilient means disposed between said yoke and housing, characterized in that the resilient means includes self-adjustable locking means comprising a movable plug member coupled with said support yoke and having a self-adjusting locking mechanism disposed between said plug member and housing, a substantially flat sloped surface connected with one of said plug member and housing and engaged by said locking mechanism, and second resilient means biasing said locking mechanism into a locking position so that said locking mechanism prevents movement of said plug member away from said pinion.

4,691,584

ACTUATOR FOR REMOTE DEVICES OR THE LIKE

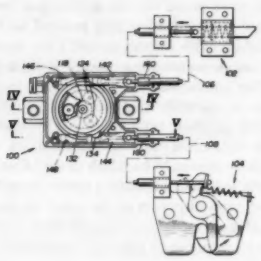
Tatsuyuki Takaishi, Yokohama; Fumio Kobayashi, Ayase; Keizaburo Usui, and Tsutomu Kagiyama, both of Yokohama, all of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Feb. 14, 1986, Ser. No. 829,029

Claims priority, application Japan, Feb. 20, 1985, 60-30569; Apr. 19, 1985, 60-82222

Int. Cl.[4] G05G 9/00; F16C 1/10

U.S. Cl. 74—471 R 13 Claims



1. An actuator for operating a remote device comprising:

a rotatable member;

a motor having a shaft, said motor being energizable to drive said shaft in first and second rotational directions;

a reduction gear operatively interposed between said motor and said rotatable member; and

a clutch;

said reduction gear comprising:

a first ring gear operatively connected with said clutch for being selectively rendered stationary with respect to a housing of said actuator;

a second ring gear connected with said rotatable member for rotation therewith;

a carrier;

pinion gears rotatably supported on said carrier, said pinion gears each having a first section which meshes with said first ring gear and a second portion which meshes with said second ring gear; and

a sun gear, said sun gear being in drive connection with the shaft of said motor.

4,691,585

GEAR SHIFT DEVICE

Achberger Gottfried, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP85/00357, § 371 Date Apr. 2, 1986, § 102(e) Date Apr. 2, 1986, PCT Pub. No. WO86/01161, PCT Pub. Date Feb. 27, 1986

PCT Filed Jul. 19, 1985, Ser. No. 859,088

Int. Cl.[4] G05G 9/16, 9/02

U.S. Cl. 74—473 R 7 Claims

1. A gear control device for an automotive vehicle comprising:

a vertical gear-control shaft mounted for rotation about a first axis and axial displacement along said first axis to shift gears of the vehicle;

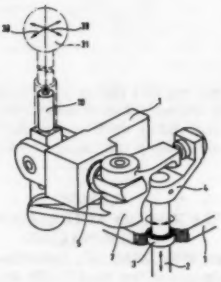
a shaft lever fixed to said gear-control shaft and having an end spaced therefrom;

a housing;

a connecting shaft rotatable in said housing about a second axis offset from and generally transverse to said first axis and at a short distance therefrom;

a bellcrank lever journaled by a fork-and-pin joint on one end of said connecting shaft for rotation about a third axis relative thereto, said third axis being generally perpendicular to said second axis, said bellcrank lever having two lever arms including a first lever arm extending transversely to said connecting shaft and parallel to said shaft lever and connected to said shaft lever and a second lever arm extending parallel to said connecting shaft;

a manual shift lever journaled by a fork-and-pin joint on an opposite end of said connecting shaft for rotation about a fourth axis relative thereto, said fourth axis being generally perpendicular to said second axis and orthogonal to said third axis;



a ball-and-socket joint connecting an end of a first of said arms with said end of said shaft lever, said ball-and-socket joint being slidable along one of said first arm and said shaft lever, said manual shift lever having a coupling arm; and

means forming a ball-and-slantguide joint between the second of said arms of said bellcrank lever and said coupling arm of said manual shift lever.

4,691,586

FINE-ADJUSTING DEVICE FOR ACCURATE POSITIONING AN ADJUSTING ELEMENT

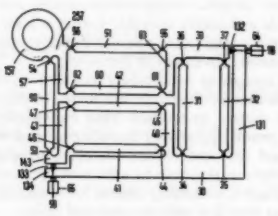
Harro M. van Leijenhorst, Zoetermeer, and Jan F. Suringh, Rotterdam, both of Netherlands, assignors to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telfonie), The Hague, Netherlands

Filed Mar. 4, 1986, Ser. No. 835,893

Claims priority, application Netherlands, Mar. 5, 1985, 8500615

Int. Cl.[4] G05G 11/00

U.S. Cl. 74—479 7 Claims



1. A fine-adjusting device for positioning a work piece in two dimensions defined by a plane surface of a metal plate, which device is capable of having its principal structure formed from a metal plate having apertures cut out therein, at least part of which apertures are slots, and accordingly comprises a slotted and apertured metal plate, wherein:

a first four-hinged frame is formed of a first pair of parallel flat bars (31, 32) having the same length measured in a straight line between the extremities of a said bar, said bars

both being reduced in width at both extremities by semicircular cutouts oppositely located on opposite bar sides forming flexure hinges (34, 36; 35, 37) connecting said first pair of flat bars to a second pair of flat bars (30, 33) which are of equal length measured between said flexure hinge connections, a first said bar (30) of said second pair being in fixed position and a second bar (33) of said second pair having at one end thereof a first rigid end extension (63) at right angles to the bar and extending towards said first bar (30) of said second pair, said first bar (30) of said second pair having a first right-angled rigid extension (40) extending towards but short of said right-angled extension (63) of said second bar of said second pair and also having a second right-angled extension (131) extending in the same direction as said first right-angled extension (40) thereof at a location such as to leave a first variable slot (132) between the end of said second extension (131) and the adjacent end of said second bar (33) of said second pair, which slot (132) extends parallel to said second right-angled extension (131) of said first bar (30) of said second pair to the vicinity of a hinge (35) connecting said first bar (30) of said second pair to a first bar (32) of said first pair, the latter bar (30) having also a straight end extension (134), an aperture being formed internally of said first four-hinged frame which aperture includes four of said semicircular cutouts located on facing sides of said bars of said first pair;

a second four-hinged frame is formed of first and second pairs of bars, said first pair of flat bars (40, 43) being straight, parallel and of equal length between hinges (44, 45; 46, 47) of said second frame connecting said first pair of bars to said second pair (41, 42) of bars in said second frame, a first bar (40) of said first pair of bars in said second frame being constituted by said first rigid extension of said first bar (30) of said second pair of said first frame for being rigidly connected to the latter bar, the bars of said second pair of bars (41, 42) in said second frame being constituted so as to maintain pairs (44, 46; 45, 47) of said hinges of said second frame always at equal distance separating the hinges of each hinge pair, each said hinge pair being composed of one hinge connecting to each of said bars of said first pair of said second frame, said hinges being formed by semicircular cutouts of both sides of end extensions of said bars of said second pair in said second frame, the second bar (43) of said first pair in said second frame having a right angled extension (143) extending away from the first bar of the same pair at the end of said second bar (43) of said first pair in said second frame which is nearer to said straight extension (134) of said first bar (30) of said second pair in said first frame, leaving an opening of a second variable slot (133) between said right-angled extension (143) of said second bar (43) of said first pair of said second frame and said straight end extension (134) of said first bar of said second pair in said first frame, said second variable slot (133) running along said straight end extension of said first bar of said second pair in said first frame to a semicircular cutout of a said flexure hinge (44) connecting said first bar (40) of said first pair in said second frame to a bar (41) of said second pair in said second frame;

a third four-hinged frame formed of a first pair of flat bars (57, 63) which are straight, parallel and of equal length between hinges (55, 61; 56, 62) of said third frame, of which pair of first said bar (63) is constituted by said right-angled end extension of said second bar (33) of said second pair in said first frame and the second bar (57) is equipped with a holder (157) rigidly attached thereto for holding an article to be positioned, said third frame having a second pair of flat bars (51, 60) constituted so as to maintain pairs (55, 56; 61, 62) of said hinges of said third frame always at equal distance separating the hinges of each pair, each said pair being composed of one hinge connecting to each said bars of said first pair of said third frame, said hinges being formed by semicircular cutouts on both sides of end extensions of said bars of said second pair of said third frame;

a coupling link flat bar (50) having a flexure hinges (53, 54) at its ends each having semicircular cutouts on both sides of the hinge portion of the bar, including a first hinge (53) connecting said link bar (50) to said right-angled end extension (143) of said second bar of said first pair in said second frame and a second hinge (54) connecting said link bar (50) to a right angled end extension (257) of said second bar of said first pair in said third frame, said link bar (50) being of a length equal to a length of the bar (31, 32) of said first pair in said first frame, and

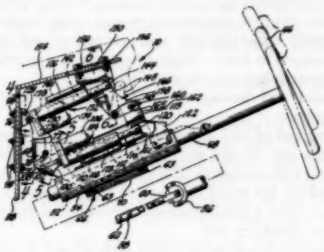
means for independently varying the respective widths of said first and second variable-width slots, including first adjusting means mounted on said second right-angled extension (131) of said first bar of said second bar pair in said first frame and second adjusting means mounted on said straight extension (134) of said first bar of said second bar pair in said first frame, whereby said holder (157) may be positioned in two dimensions in a plane by actuation of said first and second adjusting means.

4,691,587

STEERING COLUMN WITH SELECTIVELY ADJUSTABLE AND PRESET PREFERRED POSITIONS

Robert M. Farrand, Saginaw; Thomas J. Milton, Essexville, and William R. McDow, Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1985, Ser. No. 811,733
Int. Cl.[4] B62D 1/18
U.S. Cl. 74—493 **3 Claims**



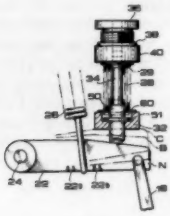
1. An articulated tilt and telescoping steering column assembly for a vehicle comprising a steering shaft assembly having an elongated steering shaft extending within the vehicle and terminating in a pivot joint at the lower end thereof, hand wheel means affixed to the upper end of said steering shaft for turning the steering shaft for steering the steerable road wheels of the vehicle, said steering column assembly including a jacket mounting said steering shaft for rotation therein and for transmitting a linear telescoping force to said shaft, an intermediate shaft assembly having first and second shaft parts and having an upper end connected to said pivot joint and a lower end adapted to be operatively connected to the steerable road wheels of the vehicle, slip joint means operatively connecting said intermediate shaft parts and allowing said intermediate shaft parts to linearly slip relative to each other and to transmit torque therebetween, tilt bracket means for supporting said jacket and said steering shaft for axial sliding movement therein, a support, pivot means for mounting said tilt bracket means to said support for tilting movement of said bracket and steering column assembly, and first and second motorized actuator means operatively connected to said support and to said jacket for moving said steering shaft assembly to an infinite number of tilt and axially adjusted positions.

4,691,588

LEVER MECHANISM IN COMBINATION WITH A SEWING MACHINE DRIVING DEVICE

Hiroshi Kumatani, and Yutaka Yamaura, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,307, Mar. 28, 1984, abandoned.
This application Mar. 7, 1986, Ser. No. 838,196
Claims priority, application Japan, Mar. 29, 1983, 58-45117[U]
Int. Cl.[4] G05G *1/14, 1/04;* F16F *1/06*
U.S. Cl. 74—512 **7 Claims**



1. A lever mechanism in combination with a sewing machine device, comprising:

(a) a pivotable lever connected to a sewing machine pedal;

(b) first spring means for biasing said lever in a first direction;

(c) a rod disposed on one side of said lever and movable by said lever when said lever is moved in said first direction from a neutral position;

(d) a first spring and a second spring having different diameters, said first and second springs being disposed concentrically about said rod, said first and second springs being arranged to exert a biasing force on said lever in a second direction opposite to said first direction;

(e) said rod having spaced first and second shoulders thereon;

(f) one end of said first spring engaging said first shoulder;

(g) one end of said second spring being positively spaced from said second shoulder when said lever is in its neutral position but being disposed to apply biasing force to said lever after a predetermined movement of said lever in said first direction; and

(h) means engaging the other ends of said first and second springs for simultaneously adjusting the biasing force exerted by said first and second springs without affecting the neutral position of said lever.

2. A lever mechanism in combination with a sewing machine device, comprising:

(a) a pivotable lever connected to a sewing machine pedal;

(b) first spring means for biasing said lever in a first direction;

(c) a first fixed member and a second fixed member spaced from said first fixed member;

(d) a rod extending between said fixed members and supported thereby, said rod being disposed on one side of said lever and movable by said lever when said lever is moved in said first direction from a neutral position;

(e) said rod having spaced first and second shoulders thereon;

(f) a first spring and a second spring having different diameters, said first and second springs being disposed concentrically about said rod, said first and second springs being arranged to exert a biasing force in a second direction opposite to said first direction;

(g) one end of said first spring and one end of said second spring being disposed in engagement with said first fixed member, the other end of said first spring engaging said first shoulder, the other end of said second spring being positively spaced from said second shoulder when said lever is in its neutral position and being disposed for exerting a biasing force on said second shoulder when said lever has moved a predetermined distance in said first direction from the neutral position of said lever; and

(h) said first fixed member including means engaging said one end of said first and second springs for simultaneously adjusting the biasing force exerted by said first and second springs without affecting the neutral position of said lever.

7. A lever mechanism in a sewing machine device, comprising:

(a) a pivotable lever connected to a sewing machine pedal;

(b) first means for biasing said lever in a first direction;

(c) a first fixed member and a second fixed member spaced from said first fixed member;

(d) a rod extending between said fixed members and supported thereby, said rod being disposed on one side of said lever and movable by said lever when said lever is moved in said first direction from a neutral position;

(e) said rod having spaced first and second shoulders thereon;

(f) a first spring and a second spring having different diameters, said first and second springs being disposed concentrically about said rod, said first and second springs being arranged to exert a biasing force in a second direction opposite to said first direction;

(g) one end of said first spring and one end of said second spring being disposed in engagement with said first fixed member, the other end of said first spring engaging said first shoulder, the other end of said second spring being spaced from said second shoulder when said lever is in its neutral position and being disposed for exerting a biasing force on said second shoulder when said lever has moved a predetermined distance in said first direction from the neutral position of said lever; and

(h) said first member including means engaging said one end of said first and second springs for simultaneously adjusting the biasing force exerted by said first and second springs without affecting the neutral position of said lever;

(i) said second fixed member having a recess therein on the side facing said first and second springs, and said second shoulder being received in said recess;

(j) a shoe slidably positioned on said rod above said recess;

(k) said other end of said second spring engaging said shoe; and

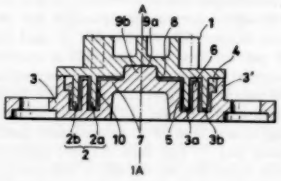
(l) said second shoulder engaging said shoe after said lever has moved a predetermined distance in said first direction from the neutral position of said lever, whereby further movement of said lever in said first direction is against the biasing force of both said first and second springs.

4,691,589

VISCOUS ROTARY DAMPER

Masaru Arakawa, Chigasaki, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Feb. 3, 1986, Ser. No. 827,546
Claims priority, application Japan, Feb. 8, 1985, 60-15955[U]
Int. Cl.[4] F16F *15/10*
U.S. Cl. 74—573 F **3 Claims**



1. A rotary damper comprising a driven gear having a rear surface, an axis of rotation and a cylindrical annular projection

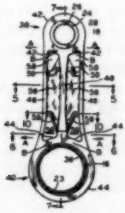
projecting from said rear surface coaxially with said gear axis, a case with a transverse bottom and having an axially extending cylindrical annular groove coaxial with said gear axis, the cylindrical annular projection being received in the cylindrical annular groove, there being a gap defined between the cylindrical annular projection and the cylindrical annular groove, grease filling said groove, an outer wall of the case defining the cylindrical annular groove having an inner periphery and a distal end opposite said bottom and being formed on said inner periphery and adjacent to said distal end with an axially extending annular depression having a greater outer diameter than the diameter of said inner periphery, said gear including a portion substantially covering said annular depression and the grease being partly forced out into the annular depression.

4,691,590

CONNECTING ROD DESIGN WITH VOIDS

Miles S. Geringer, Milwaukee, and Vernon R. Kaufman, Cedarburg, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 6, 1986, Ser. No. 816,208
Int. Cl.⁴ G05G *1/00*
U.S. Cl. 74—579 E **20 Claims**



15. A connecting rod for interconnecting reciprocating and rotating members in an internal combustion engine, said connecting rod comprising:

a unitary piston pin ring portion having a bore therein and including an outer peripheral surface;

a unitary crankshaft ring portion having a bore therein and including an outer peripheral surface;

a connecting member for interconnecting said ring portions and including three ribs which are coplanar with said ring portions and are substantially parallel to each other, one end of each said ribs being directly connected to the outer peripheral surface of said piston pin ring portion and the other end of each said ribs being directly connected to the outer peripheral surface of said crankshaft ring portion, the first of said three ribs being located between the other two ribs and being arranged substantially perpendicularly to the outer peripheral surfaces of said respective ring portions;

two webs extending between and respectively interconnecting said ribs; and

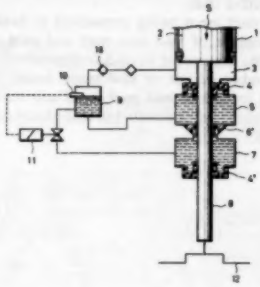
a plurality of voids located between said ribs, between said webs and the outer peripheral surfaces of said ring portions.

4,691,591

ROD SEAL DEVICE FOR STIRLING ENGINES

Daisaku Kobayashi; Tunesaku Itaba, both of Kashiwazaki, and Yutaka Momose, Anjyo, all of Japan, assignors to Kabushiki Kaisha Riken, Tokyo and Aisin Seiki Kabushiki Kaisha, Aichi, both of, Japan

Filed Feb. 12, 1986, Ser. No. 828,660
Claims priority, application Japan, Feb. 20, 1985, 60-23260[U]
Int. Cl.⁴ F16H *57/02*; F16J *15/00, 3/00*
U.S. Cl. 74—606 A **5 Claims**



1. A rod seal device for a Stirling engine comprising:

a piston rod connecting an operating piston of the Stirling engine with a driving means serving as a power takeoff;

a first scraper seal ring disposed next to one end of a compression chamber which is defined by one end of said piston and a cylinder of said engine;

a high pressure oil chamber disposed next to said first scraper seal and surrounding said piston rod;

an oil seal disposed next to said high pressure oil chamber and surrounding said piston rod;

a low pressure oil chamber disposed next to said oil seal and surrounding said piston rod;

means for scraping oil from said low pressure oil chamber to said high pressure oil chamber through said oil seal, said urging means including a second scraper seal disposed operatively next to said low pressure oil chamber and surrounding said piston rod, wherein said oil seal includes a tapered outer peripheral surface for contacting a holder, a larger diametrical end surface facing one end of said high pressure oil chamber, a smaller diametrical end surface facing one end of said low pressure oil chamber and an annular slit provided on said smaller diametrical end surface and open thereto; and

means for returning oil from said high pressure oil chamber to said low pressure oil chamber, said returning means comprising an oil reservoir, first means for communicating said high pressure oil chamber with said oil reservoir and second means for communicating said oil reservoir with said low pressure oil chamber, whereby oil may flow from said high pressure oil chamber to said low pressure oil chamber through said oil reservoir.

4,691,592

CONTINUOUSLY-VARIABLE RATIO TRANSMISSION

Forbes G. de Brie Perry, Charlbury, England, assignor to National Research Development Corporation, London, England

Filed Nov. 19, 1984, Ser. No. 672,897
Claims priority, application United Kingdom, Nov. 17, 1983, 8330682
Int. Cl.⁴ F16H *37/06, 15/50*
U.S. Cl. 74—691 **5 Claims**

1. A continuously-variable ratio transmission capable for working in two regimes and having a casing and including:

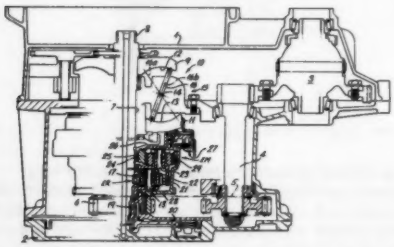
a final output member;

first and second parts; said first part including a variator comprising a unit operable to vary the transmitted ratio in a stepless manner, having an input connectable to a prime mover and an output;

said second part including an input and an output and two epicyclic trains disposed between said second part input and output, each of said trains respectively comprising a sun member, a planet carrier and an annulus, said planet carrier of each of said respective epicyclic trains carrying a single planet gear in engagement both with said sun member of its respective train and with said annuluar of its said respective train;

said second part input being connected to both said input and said output of said first part and said second part output being connected to said first member;

said sun member of one of said trains being permanently connected to said second part input and said annulus of said one train being connected to said planet carrier of said other train;



a first clutch member;

said final output member being connected to said annulus of said other train and being connectable by means of said clutch member to said first part output and anchoring means being provided whereby said planet carrier of said one train is capable of being anchored to said casing;

whereby said transmission is capable of operating so that in said first regime said first clutch member is disengaged, with said planet carrier of said one train being anchored to said casing and the motion of said final output member reflects the geared motion of both said trains in response to both said first part's input and output transmitted to said final output member by way of said annulus of said other of said trains, whereas in said second regime said first clutch member is engaged so that said final output member is connected directly to said second part output, and said anchoring means are released so that said planet carrier of said one train imposes no restraint upon other components of said trains which are thereby free to idle.

4,691,593

LIMITED SLIP DIFFERENTIAL SYSTEM FOR A MOTOR VEHICLE WITH ALL-WHEEL DRIVE

Robert Mueller, Moensheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,381

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507490

Int. Cl.[4] F16H *1/42, 1/28*

U.S. Cl. 74—714 **16 Claims**

1. A limited slip differential system for the drive train of the front and rear axles of a motor vehicle with a continuous all-wheel drive, having an intermediate planetary transmission in the direct through drive and a corresponding braking device engageable with said intermediate planetary transmission in response to a rotational difference between the front and rear axles,

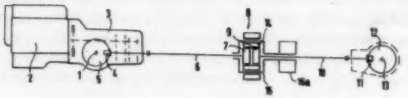
wherein a transmission ratio between said braking device and said planetary transmission is substantially higher than a transmission ratio for said direct through drive,

wherein said direct through drive comprises:

an inlet sun gear;

an outlet sun gear connected to an auxiliary axle to be driven, said outlet sun gear being adjacent, coaxial and having more teeth than said inlet sun gear;

a planet gear wheel of a planet carrier, wherein said planet



gear wheel is engageable with at least one of said sun gears and wherein rotational movement of said planet gear wheel is selectively braked by said braking device;

wherein the through drive ratio of said planetary transmission from said front axle to said rear axle is inverse to the ratio of gear drive means of the front axle to gear drive means of the rear axle, such that said planetary carrier is stationary when said rotational speed difference of the front and rear axles is zero.

4,691,594

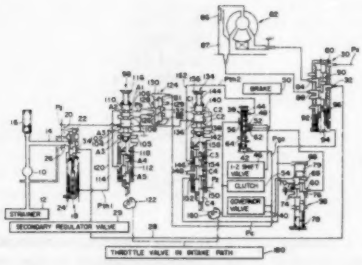
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Yutaka Taga, Aichi, and Kunio Morisawa, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 7, 1985, Ser. No. 689,305

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—869 **1 Claim**



1. A hydraulic control system for an automatic transmission, comprising:

a first throttle valve which produces a first throttle pressure having a first characteristic with respect to an output of an engine, wherein said first throttle valve comprises a first input port which receives a line pressure, a first output port for generating the first throttle pressure, a first spool for controlling a first flow area between the first input port and the first output port, a first spring for urging the first spool in a direction in which the first flow area decreases, and a first cam which rotates in relation to a movement of a member for controlling the output of the engine and urges the first spool in a direction in which the first flow area increases;

a second throttle valve which produces a second throttle pressure having a second characteristic with respect to the output of the engine, wherein said second throttle valve comprises a second input port for receiving the line pressure, a second output port for generating the second throttle pressure, a second spool for controlling a second flow area between the second input port and the second output

port, a second spring for urging the second spool in a direction in which the second flow area decreases, and a second cam which rotates in relation to the movement of the member for controlling the output of the engine and urges the second spool in a direction in which the second flow area increases;

a valve for regulating the line pressure during a first performance relative to the output of the engine via said first throttle pressure; and

a shift value for controlling a shift point of the automatic transmission during a second performance relative to the output of the engine via said second throttle pressure.

4,691,595

PLANETARY TRANSMISSION BASED ON FRICTION

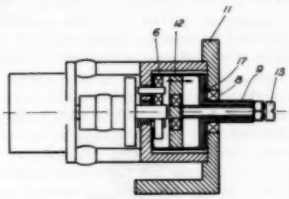
Ilmari Kinanen, Espoo, and Sulo Ranne, Helsinki, both of Finland, assignors to Orion-yhtyma Oy, Helsinki, Finland

Filed Nov. 4, 1985, Ser. No. 794,580

Claims priority, application Finland, Nov. 16, 1984, 844519

Int. Cl.[4] F16H *13/06, 13/10*

U.S. Cl. 74—798 **2 Claims**



1. A friction based planetary transmission, which comprises a rotatable shaft, cylindrical rollers rotatably engaging the outer periphery of said rotatable shaft at at least two different positions, an outer peripheral member having an open tubular end portion surrounding said cylindrical rollers and engaging the rollers with its inner surface, said tubular portion being of thin elastic material and having an interference fit around the rollers in order to slightly deform during rotation thereof and thus to produce a pressure against the rollers, the outer peripheral member also including a central shaft portion connected to, or intergral with the tubular portion and extending away from the open end of the tubular portion, and a supporting disc positioned inside the tubular portion at an axially adjustable distance from the rollers towards the shaft portion of the peripheral member, said disc being closely fitted against the inner wall of the tubular portion in order to adjust the elasticity of the open end of the tubular member according to the axial position of the supporting disc.

4,691,596

AUTOMATIC TRANSMISSION WITH ANTI CREEP DEVICE

Masao Nishikawa, and Yoshimi Sakurai, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,358

Claims priority, application Japan, Sep. 20, 1983, 58-173610; Sep. 20, 1983, 58-173611

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—869 **4 Claims**

1. An automatic transmission, comprising:

(a) a fluid coupling;

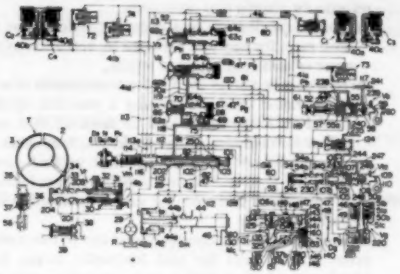
(b) a mechanical transmission mechanism coupled to said fluid coupling, comprising a plurality of power trains and a plurality of friction engagement mechanisms, various ones of said power trains being selectively engageable according to selective supply of actuating fluid pressure to selective ones of said friction engagement mechanisms to provide various speed stages including a lowest speed stage; and

(c) a transmission control system comprising:

(d) a means for producing a hydraulic pressure representative of engine output;

(e) an anti creep valve for varying the actuating hydraulic fluid pressure for a one of said friction engagement mechansms which is engaged for providing said lowest speed stage, according to said hydraulic pressure representative of engine output, from a small value when engine output is low upward as engine output increases;

(f) a means for inhibiting the action of said anti creep valve



operatie to cause said actuating hydraulic fluid pressure for said one of said friction engagement mechanisms to be at its high value when said mechanical transmission mechanism is providing one of its speed stages higher than said lowest speed stage;

(g) a shifting valve for switching between a pair of adjacent speed stages which produces a certain hydraulic fluid pressure when the higher one of said adjacent speed stages is engaged, said certain hydraulic fluid pressure being supplied to said inhibiting means; and

(h) wherein said inhibiting means comprises a means for inhibiting the action of said anti creep valve on receiving said certain hydraulic fluid pressure.

4,691,597

CONTROL SYSTEM FOR A FOUR-SPEED AUTOMATIC TRANSMISSION

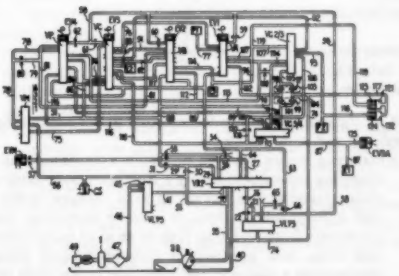
Francois Leorat, Versailles; Patrick Coutant, Rueil Malmaison, and Paul Aubert, Clamart, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 18, 1985, Ser. No. 777,444

Claims priority, application France, Sep. 18, 1984, 84 14262

Int. Cl.[4] B60K *41/18, 41/16*

U.S. Cl. 74—869 **37 Claims**



1. A control system for an automatic transmission having four forward speeds and a reverse speed, said automatic trans-

mission including a hydrokinetic torque converter having an integral torsion damper, said automatic transmission including a planetary gear train controlled by three clutches and two brakes, said clutches and brakes each being activated by hydraulic means, said control system comprising:

a hydraulic distributor including means for selectively distributing hydraulic fluid to said hydraulic means of said clutches and brakes;

four solenoid valves operatively connected to said means for selectively distributing for actuating said means for selectively distributing; and

control means sensitive to vehicle operation data for controlling said four solenoid valves, wherein said means for selectively distributing comprises:

means for distributing said hydraulic fluid at one of two flow rates for any line pressure by actuation of at least some of said four solenoid valves,

three sequence valves each being connectable to a source of hydraulic fluid and having a movable spool connected to a respective one of three of said solenoid valves for distributing said hydraulic fluid, and

a progressiveness valve connectable to said source of hydraulic fluid and having a movable spool connected to a fourth of said solenoid valves for distributing said hydraulic fluid,

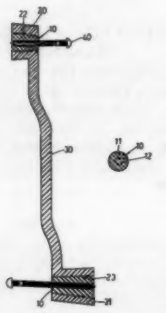
wherein said means for distributing at one of two rates comprises a feed duct for said hydraulic means for said clutches and brakes with a large passage section and including said progressiveness valve, in parallel with a feed duct for said hydraulic means for said clutches and brakes with a small passage section, whereby said hydraulic fluid can be supplied to said hydraulic means at a reduced flow rate by using said progressiveness valve to close said feed duct having said large passage section.

4,691,598

CLAMPING APPARATUS FOR HAMMERING A HARDENED NAIL

Min-Shin Lin, 116 Yuan tzyy Street, Taichung city, Taiwan

Filed Mar. 26, 1986, Ser. No. 844,007
Int. Cl.[4] B25B *9/00*
U.S. Cl. 81—44 **3 Claims**



1. A clamping apparatus for assisting in the hammering of a hardened nail, comprising

a clamping means adapted to clamp a hardened nail, said clamping means comprising a truncated cone made of an elastic material and having an axial through center hole and a longitudinal through groove extending radially outwardly from said axial hole to an axial outer surface of said cone, said longitudinal through groove being for disengaging a clamped nail from said center hole and for achieving a flexibility for receiving hardened nails of different gauge within said axial hole;

a ring sleeve having an outer surface and a tapered inner surface for receiving therein said truncated cone clamping means; and

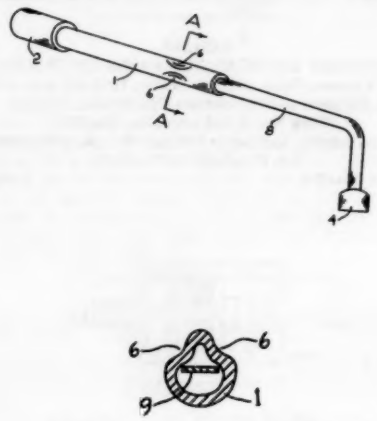
an elongated handle connected to the outer surface of said ring sleeve.

4,691,599

LUG WRENCH EXTENSION HANDLE

Jerald Schultz, 354 Longacre Ave., Woodmere, N.Y. 11598

Filed Jan. 3, 1986, Ser. No. 816,066
Int. Cl.[4] B25G *1/04*
U.S. Cl. 81—177.2 **1 Claim**



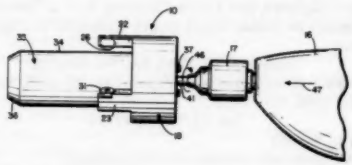
1. An automobile wheel lug nut wrench extension handle consisting of a length of straight round metal tube, having at a short distance from one end means for gripping a taper on one end of an automobile lug nut wrench, said gripping means forming a stop means for limiting the longitudinal insertion and rotation of said wrench relative to said handle, said gripping means comprising two adjacent indentations in said tube which forms in the bore of the tube bearing surfaces for securely engaging said taper of said lug nut wrench, said extension handle having on an end opposite the end on which the gripping means is disposed a hand grip for use in gripping and rotating said extension handle and lug wrench conjointly by an operator.

4,691,600

PIPE SHAVER

Larry M. Carlson, and Douglas J. Braun, both of 4903 S. Cedar Lake Rd., Minneapolis, Minn. 55416

Filed Nov. 20, 1985, Ser. No. 799,821
Int. Cl.[4] B23B *5/16*
U.S. Cl. 82—4 C **15 Claims**



1. An apparatus for removing material from the outer surface of an end section of a tubular member having a cylindrical longitudinal passage in said end section comprising: a generally cup-shaped body having a longitudinally extended cylindrical side wall with a first end and a second end, a transverse base joined to the first end of the wall, a plurality of lugs joined to

the second end of the wall, said side wall, base, and lugs comprising a one-piece cup shaped body, said lugs being circumferentially spaced from each other, each of said lugs being longitudinally away from said second end, each lug having a forward side with an outer end, a recess in the outer end of said forward side, a cutting tool located in each recess connected to each lug for removing material from the outer surface of the end section of the tubular member, each cutting tool comprising a cutting disc having a flat portion in engagement with the forward side of the lugs, a cone shaped outer surface, and an outer circular cutting edge at the large end of said cone shaped outer surface, each disc located in a radial plane extended through the axis of rotation of the apparatus, means securing the discs to the lugs to hold said flat portion thereof in engagement with the forward sides of the lugs and locate a portion of the cutting edge radially inwardly of said lugs, a mandrel having an inner end positioned in engagement with the base, means extended through said base to non-rotatably secure the mandrel to the base, said mandrel having a cylindrical outer surface spaced inwardly from said side wall providing an annular space and a forward end projected longitudinally away from the body, said cylindrical outer surface being of a size to fit into the cylindrical longitudinal passage of the tubular member to guide the apparatus into said end section of the tubular member, said base having an annular stop surface engageable with the tubular member to limit the length of the outer surface of the tubular member from which material is removed, means secured to the mandrel adapted to be connected to means for rotating the apparatus about the longitudinal axis of the mandrel whereby when the mandrel is moved into the passage of the tubular member and rotated with the means for rotating the apparatus whereby the cutting discs remove material from the outer surface of the end section of the tubular member providing a smooth uniform diameter cylindrical surface thereon, and the end section of the tubular member moves into said annular space until the end thereof abuts against the annular stop surface of the base.

4,691,601

METHOD OF SAWING A STEEL STRUCTURAL SHAPE HAVING AT LEAST ONE FLANGE

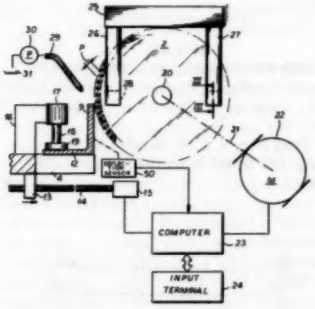
Rolf Peddinghaus, Deterbergerstr. 25, 5828 Ennepetal, Fed. Rep. of Germany

Filed Mar. 17, 1986, Ser. No. 840,438

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509522

Int. Cl.[4] B23D *45/02*

U.S. Cl. 83—56 **7 Claims**



1. A process for sawing a structural steel shape having at least one structural flange, in a saw apparatus with a rotary metal saw having a specified number of teeth, comprising the steps of:

(a) clamping said structural steel shape within range of said metal saw;

(b) rotating said metal saw at a specified number of r.p.m. to establish a speed of a cut by the number of r.p.m., the number of sawteeth, and the radius of said metal saw;

(c) relatively displacing the clamped shape and the saw to feed said metal saw toward a projected sawcut at a specified feed speed;

(d) determining a tooth succession time from the number of teeth and the number of r.p.m. of said metal saw;

(e) subjecting said structural flange to a forced elastic deflection by cutting engagement of said saw with said shape;

(f) determining an oscillation time of oscillation of said structural flange caused by the elastic deflection of said flange; and

(g) controlling the r.p.m. of said saw and said feed speed such that the tooth succession time is small compared to the oscillation time, whereby said structural flange is held fast in a deflected position by said sawteeth following each other.

4,691,602

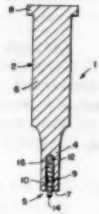
PUNCH AND EJECTOR ASSEMBLY

Edward Schlueter, 61 Norton Dr., East Northport, N.Y. 11731

Filed Sep. 14, 1981, Ser. No. 301,951

Int. Cl.[4] B26D *7/18*

U.S. Cl. 83—128 **7 Claims**



1. A piercing punch and ejector assembly comprising:

a piercing punch member having a point thickness section, said section provided with a longitudinal bore; and

an ejector member comprising a conical helical spring of rectangular cross section capable of being folded such that its length is reduceable to that of its width.

4,691,603

CUTTING APPARATUS FOR CUTTING SHEET MATERIAL

Aloys Winnemöller, Rheine, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,119

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503094

Int. Cl.[4] B26D *7/06*

U.S. Cl. 83—151 **6 Claims**

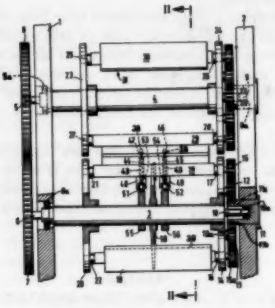
1. A cutting apparatus for cutting sheet materials, said apparatus comprising:

(a) cutter means for carrying a sheet material cutter member, said cutter means rotatable about a first axis and said cutter member rotatable about a second axis spaced from and parallel to said first axis;

(b) cutter backup means for carrying a backup member cooperable with said cutter member for effecting cutting of sheet material that is passed between said cutter member and said backup member to define a removable waste sheet portion, said cutter backup means rotatable about a third axis spaced from and parallel to said first axis, said backup member rotatable about a fourth axis spaced from and parallel to said third axis; and

(c) retractable needle means carried by one of said cutter means and said cutter backup means for piercing said removable waste sheet portion to effect removal thereof

from the sheet material after cutting, said needle means, including a needle and a needle holder therefor, supported for movement along the longitudinal axis of the needle and having a cam follower engageable with a rotatable



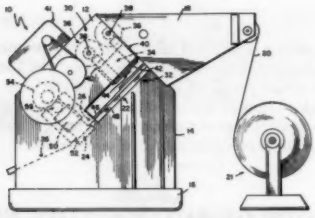
cam carried by said one of said cutter means and said cutter backup means to move said needle means into piercing engagement with the waste sheet portion and remove the waste sheet portion from the sheet material.

4,691,604

ANTI-JAMMING DIE

Kenneth Carmichael, Marion, Ind., assignor to Peerless Machine & Tool Corporation, Marion, Ind.

Filed Apr. 25, 1986, Ser. No. 855,739
Int. Cl.[4] B26D *7/06*
U.S. Cl. 83—164 **22 Claims**



1. A press die system for producing blanks from a sheet of material, the press die system comprising

a die shoe having an inclined blank delivery region,

partition means for dividing the inclined blank delivery region into a plurality of blank-receiving die lanes having entry regions and individual exit regions, the partition means separating at least one of the blank-receiving die lanes and an adjacent blank-receiving die lane including a first end in close proximity to the exit region of the at least one of the blank-receiving die lanes and a second end positioned in spaced relation to the entrance region of the at least one of the blank-receiving die lanes to provide an open region joining the at least one of the blank-receiving die lanes and the adjacent blank-receiving die lane away from the open region,

blanking means for piercing the sheet of material in a predetermined pattern to provide a plurality of blanks in alignment with the entry region of the blank-receiving lanes so that each blank falls under gravity into one of the blank-receiving die lanes, and

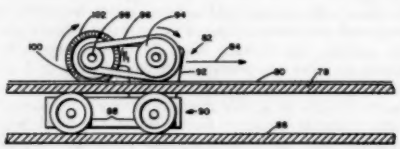
ramp means for guiding blanks generated by the blanking means as the blanks move under gravity through the at least one of the blank-receiving die lanes in a lateral direction away from the adjacent blank-receiving die lane to aid in preventing entanglement in said open region of blanks in said one of the blank-receiving die lanes with blanks in said adjacent blank-receiving die lane.

4,691,605

CUTTER ASSEMBLY WITH ROTATING KNIFE BLADE

Anatoly Vanetik, Fullerton, and Brian C. Preston, Anaheim, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 22, 1985, Ser. No. 757,618
Int. Cl.[4] B26D *7/14*
U.S. Cl. 83—175 **3 Claims**



1. For cutting web material, a cutter assembly comprising:

A. frame;

B. a drag roller rotatably mounted on the frame for rotation about a drag-roller axis, the drag roller having a peripheral engagement surface adapted for engagement of web material so that the drag roller is caused to rotate when the frame and drag roller move with respect to the web material in a direction perpendicular to the drag-roller axis while the web material engages the engagement surface;

C. a circular cutter rotatably mounted on the frame for rotation about a cutter axis substantially parallel to the drag-roller axis, the cutter having a peripheral endless blade and being disposed with respect to the drag roller for cutting engagement of web material by endless blade while the drag-roller engagement surface engages the web material; and

D. means connected to the drag roller for rotating the cutter, when the frame moves with respect to the web material in the direction in which the tension roller precedes the cutter, at such speed that the peripheral speed of the endless blade differs from the speed of the cutter assembly and the drag roller with respect to the web material so that the web material is effectively maintained in tension at the point at which the endless blade engages the web as relative movement occurs between the web and the cutter assembly.

4,691,606

WEB PERFORATING APPARATUS

Roy A. Johnson, Marietta, Ga., and Robert H. Ganz, Saddle River, N.J., assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 1, 1986, Ser. No. 891,646
Int. Cl.[4] B26D *7/14, 1/62;* B26F *1/20*
U.S. Cl. 83—175 **9 Claims**

1. Apparatus for perforating at spaced intervals a continuously moving flexible web said apparatus comprising means for moving and tensioning the web, a plurality of perforating knives mounted in peripherally spaced relation on a rotatable

mandrel disposed adjacent the web and movable into perforating engagement therewith to impart perforations which are disposed in a transverse direction only to the direction of peripheral movement of the web, said perforating knives being disposed at an obtuse angle to the infeed end of the web and being movable at a peripheral velocity which is less than the linear velocity of the web during perforation thereof and being movable away from the web at a peripheral velocity somewhat greater than the linear velocity of the web following completion of a perforating operation, and means for controlling the velocity of rotation of said mandrel to provide variations in repeat lengths between perforations.

4,691,607

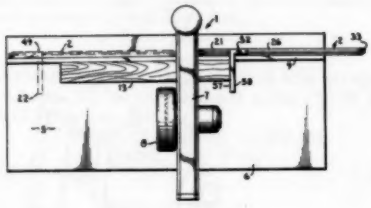
RADIAL ARM SAW POSITIONER

Floyd A. Webb, 611 E. Sheridan, Olathe, Kans. 66061

Filed Apr. 7, 1986, Ser. No. 849,168

Int. Cl.[4] B27B *5/20, 27/10*

U.S. Cl. 83—468 **4 Claims**



1. A positioner adapted for retrofitting to a power saw wherein a cutting blade is movable relative to a table top; the saw having a fence attached to the table top for positioning a workpiece; said positioner comprising:

(a) a support structure adapted to be removably attached to the table top behind the fence; said support structure comprising a unitary elongate member base strip having upstanding struts at either end thereof, a pair of fastener openings and a pair of elongated slots each communicating with a respective fastener opening;

(b) a slide bar non-rotatably mounted near opposite ends thereof to said support structure struts and adapted to be positioned along and spaced from the fence;

(c) a slide mounted on said slide bar and being axially positionable at an infinite number of positions therealong; said slide selectively being rotatably positionable relative to said slide bar;

(d) said slide including a workpiece stop member extending laterally from said slide and adapted to engage a workpiece on the saw;

(e) locking means to selectively lock said slide axially with respect to said slide bar;

(f) said stop including a bridge member allowing said stop to arc over the fence at any location along said slide bar such that said stop member is positionable against a work surface of the saw in front of the fence and is infinitely adjustable along the fence and such that said slide is rotatable away from the work surface to a location above said slide bar such that said positioner is free of interference with a workpiece on the work surface and further said bridge allows said slide to be adapted to work cooperatively with the fence of the saw so that the slide does not interfere with the fence during use and the fence does not have to be modified to use said positioner; and

(g) fastening means for removably attaching said support structure to said table top such that said positioner may be retrofitted on said table top and may be selectively removed when not in use, said fastening means comprising a pair of screws with heads having diameters less than the widths of said fastener openings and greater than the width of said slots.

4,691,608

WAVEFORM NORMALIZER FOR ELECTRONIC MUSICAL INSTRUMENT

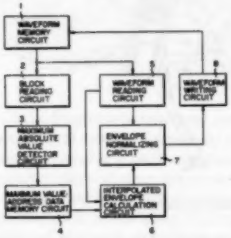
Hiroyuki Sasaki, and Kohtaro Hanzawa, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 910,207

Claims priority, application Japan, Sep. 30, 1985, 60-216744; Feb. 19, 1986, 61-32877

Int. Cl.[4] G10H *1/057, 7/00*

U.S. Cl. 84—1.01 **19 Claims**



1. A waveform normalizer for an electronic musical instrument, in which an input waveform signal is converted into a digital signal, stored in waveform memory means and converted into a sound signal having a designated frequency, comprising:

envelope extracting means for extracting an envelope signal from said input waveform signal;

normalization processing means for normalizing said input waveform signal according to an envelope signal extracted from said envelope extracting means to obtain a normalized waveform signal; and

control means for causing said normalized waveform signal obtained from said normalization processing means to be supplied to and stored in said waveform memory means.

4,691,609

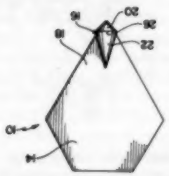
STYLUS PICK FOR STRINGED MUSICAL INSTRUMENTS

Richard A. Acocella, Boston, Mass., assignor to Robert G. Rice, Sharon, Mass., a part interest

Filed Dec. 9, 1986, Ser. No. 941,226

Int. Cl.[4] G10D *3/16*

U.S. Cl. 84—322 **10 Claims**



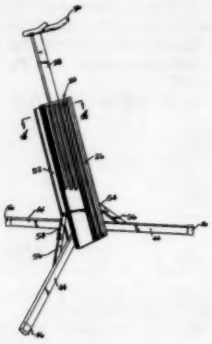
1. A pick for a stringed musical instrument comprising a pick body adapted to be grasped between a thumb and forefinger of a musician and a stylus on said body adjacent a peripheral edge thereof, said stylus including a tip portion of substantially pointed conical configuration which projects outwardly beyond said peripheral edge terminating substantially in a point.

4,691,610

GUITAR STAND WITH FOLD-AWAY, SUBSTANTIALLY CONCEALABLE LEGS

David S. Gilbert, Huntington Beach, Calif., assignor to William H. Howard, Newport Beach, Calif.

Filed Jun. 13, 1986, Ser. No. 873,800
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—327 **19 Claims**



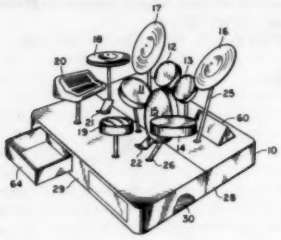
1. A guitar stand comprising:
a main body;
a yoke adapted for holding the neck of a guitar;
an elongated member mounted for sliding motion relative to the main body, the yoke being pivotably mounted to the elongated member;
a plurality of legs foldably mounted to the main body and thereby comprising means in their extended position for supporting the guitar stand;
first channel means incorporated in the main body for receiving and substantially concealing the legs when said legs are folded, and
second channel means incorporated in the main body for receiving and substantially concealing the elongated member when the elongated member is not extended relative to the main body.

4,691,611

ELECTRONIC PERCUSSION INSTRUMENT

Gordon H. May, 3261 Woodleigh La., Cameron Park, Calif. 95682

Filed Oct. 9, 1985, Ser. No. 785,764
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—421 **1 Claim**



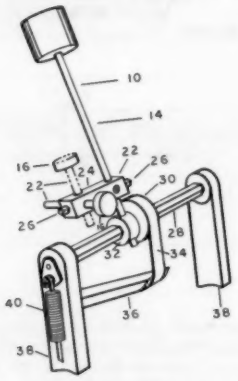
1. A percussion instrument comprising:
a base forming internally a compartment;
a plurality of percussion heads which, when struck, will generate percussion sounds;
a head stand for each percussion head comprising;
an elongated standard for each percussion head;
a socket fixed to said base and each said percussion head for attachment of a standard to each head and the base to support the head above said base;
means to adjust and permanently set the length of said standard; and
means to adjust and permanently set the angle of each socket so as to adjust the angle of the standard relative to said base and the attached percussion head thereby to allow the percussion instrument to be assembled and adjusted once and to provide memory for allowing the instrument to be set up the same way each time it is disassembled.

4,691,612

ACCESSORY FOR A DRUM PEDAL ASSEMBLY

Peter L. Smith, 36 Tahattawan Rd., P.O. Box 443, Littleton, Mass. 01460

Continuation-in-part of Ser. No. 789,133, Oct. 18, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 942,801
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 R **13 Claims**



1. a drum pedal assembly having a drum beater element secured to a pedal actuated rotatory element, means to adjust the distribution of weight acting on the rotatory element comprising:
(A) a metal weight with straight parallel sides;
(B) a mount means to rotatively carry said metal weight;
(C) means to adjustably secure said metal weight to said mounted means; and
(D) means to secure said mount means to either said rotatory element of said beater element, whereby adjustment of said metal weight affects the balance point of the stroke of the beater element as well as the rotational forces influencing the character of the stroke of said beater element.

4,691,613

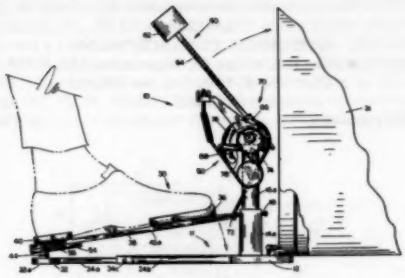
BASS DRUM PEDAL

Luke Jacobson, Box 115, Grenora, N. Dak. 58845

Filed Sep. 29, 1986, Ser. No. 912,415
Int. Cl.[4] G10D *13/00*
U.S. Cl. 84—422 R **11 Claims**

1. A bass drum pedal comprising;
a base frame;
a footplate pivotally connected at a heel end to said frame;
a pair of upstanding support members projecting from said frame supporting a generally horizontally disposed rotatable drive shaft therebetween;
a hammer assembly, including a hammer carried at the end of a shaft connected to said drive shaft;
a drive assembly connecting said footplate and drive shaft, for rotating the drive shaft to move said hammer into contact with a drum when said footplate is depressed, said drive assembly including:
(a) flexible means adjustably connecting said footplate to a first end of a torque arm adjustably connected to said drive shaft;

(b) said torque arm having a general spiral shape with a groove in its perimeter for carrying said flexible means;
(c) said torque arm adjustably connected to said drive shaft



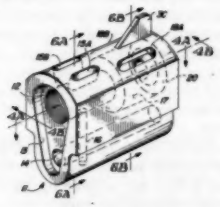
and adapted for selective adjustment within a plane perpendicular to said drive shaft; and
biasing means connected to said drive shaft, for resisting rotational movement of said drive shaft.

4,691,614

NONSYMMETRICAL COMPENSATOR FOR HANDGUN

Leon E. Leffel, 2473 1st St., and Rick G. Leffel, 2723 W. 1st St., both of Yuma, Ariz. 85364

Filed May 30, 1986, Ser. No. 868,951
Int. Cl.[4] F41F *17/12*
U.S. Cl. 89—14.3 **7 Claims**



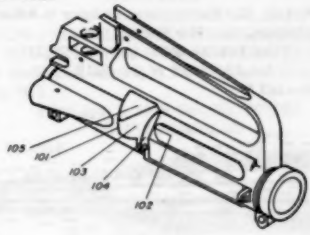
1. A compensating apparatus for resisting both muzzle climb and twist of a handgun in reaction to firing a bullet, the compensating apparatus comprising in combination:
(a) a threaded end of a barrel of the handgun, and first and second high pressure gas outlet ports disposed on either side of an imaginary vertical plane passing through the center of a bore through the barrel and through a gunsight of the handgun; and
(b) a compensator including a threaded bore receiving the threaded end of the barrel and also including an enlarged expansion chamber into which high pressure gas following a bullet being fired can expand, the compensator including third and fourth high pressure gas outlet ports aligned with the first and second high pressure gas outlet ports, respectively, the compensator also including first and second vertical low pressure gas outlet ports extending from upper surface portions of the compensator on either side of the imaginary vertical plane into the enlarged expansion chamber, the second vertical low pressure gas outlet port being substantially larger than the first vertical low pressure gas outlet port, the second vertical low pressure gas outlet port being located further from the imaginary vertical plane than the first vertical low pressure gas outlet port, whereby nonsymmetrically, non-radially discharged amounts of low pressure gas from the enlarged expansion chamber produce a countertorque resisting twist of the handgun due to counterforce applied by the accelerating bullet to rifling of the bore of the barrel, high pressure gas upwardly exhausted from the third and fourth high pressure gas outlet ports effectively resisting muzzle climb.

4,691,615

M-16 RIFLE, IMPROVED TO MORE SAFELY ACCOMODATE LEFT HANDED SHOOTERS

Loren F. Brunton, 363 - 34th Ave., East Moline, Ill. 61244

Continuation-in-part of Ser. No. 505,621, Jun. 20, 1983, Pat. No. Des. 285,236. This application Mar. 27, 1986, Ser. No. 845,672
Int. Cl.[4] F41C *27/00*
U.S. Cl. 89—33.4 **4 Claims**



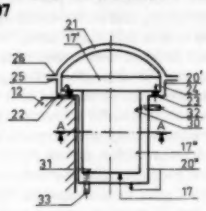
1. A receiver for a firearm wherein spent cartridge cases are ejected in a trajectory of motion rearwardly at a side ejection port thereof, said port having a back stop rib means at its rear position, said receiver ejecting cases whose rearward motion is stopped when striking said back stop rib means and also cases whose rearward motion is not stopped despite striking, or by completely missing of, said back stop rib means and continue in a rearward trajectory towards the person of the shooter, said receiver comprising a boss thereon to change the rearward trajectory of those non-stopped cases so they can never strike the physical body of the shooter, on account of their changed trajectory.

4,691,616

ARRANGEMENT FOR FIRE CONTROL

Klas G. I. Larsson, Järfälla; Rolf C. Lindholm, Upplands Väsby, and Johan P. Ström, Järfälla, all of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1986, Ser. No. 821,565
Claims priority, application Sweden, Jan. 25, 1985, 8500360
Int. Cl.[4] F41G *1/04*
U.S. Cl. 89—41.07 **4 Claims**



1. A fire control system for a gun having a fire tube and an elevation system comprising set motors for setting the horizontal and vertical position of the fire tube, such fire control system comprising a tracking radar unit having a radar transmitter/receiver and an antenna, the tracking radar unit being mounted directly on the gun so that the axis of the antenna forms a given angle with the axis of the fire tube, and producing control signals in a closed servo loop connected to the set motors of the gun so that, after locking on a target, the movement of the axis of the radar unit causes the axis of the fire tube to track the target by controlling the set motors; characterized in that the radar unit is supported within an envelope which is rigidly mounted on the elevation system of the gun, the radar unit being fastened to the envelope by elastically resilient supporting elements at opposite surfaces of the envelope and the radar unit, said envelope being closed at the front by a radome which is dimensioned to withstand the forces arising upon firing of the gun in order to prevent deformation of the

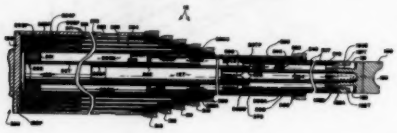
antenna and ensure correct target tracking, said protection envelope having apertures therein for connection to a source of thermal fluid medium for controlling the temperature within such envelope.

4,691,617

MULTI-SECTION SWEEP CYCLE COMPACTION CYLINDER

Hans D. Purkott, Hot Springs, Ark., assignor to Arkansas Precision Hydraulics, Inc., Hot Springs, Ark.

Filed Feb. 14, 1986, Ser. No. 829,216
Int. Cl.[4] F15B *11/18*; F01B *7/20*
U.S. Cl. 91—167 R **7 Claims**



4. A multi-segment, triple action, telescoping hydraulic ram for selectively either fully or partially actuating a device such as a compression platen assembly operatively associated with the garbage receptive cargo area of a conventional garbage truck, said ram comprising:

a first, outermost, largest diameter, rigid elongated, cylinder comprising a terminal end cap having an external fitting adapted to be coupled to said platen within said cargo area;

a plurality of coaxially disposed, cooperating non sweep cycle cylinders telescopingly disposed internally of said first cylinder, and selectively extensible with respect thereto;

selectively extensible sweep cycle cylinder means comprising a first and a smaller second sweep cycle cylinder operationally disposed coaxially within the smallest one of said last mentioned plurality of non sweep cylinders and adapted to be extended or retracted relative to one another when said non sweep cycle cylinders are in a retracted position, a terminal end of the smallest sweep cycle cylinder terminating in pin eye fitting means for physically anchoring said sweep cycle cylinder means and thus said ram within said cargo area;

end block means secured within said ram and spaced apart from said end cap for internally defining primary pressure chamber means between itself and said endcap;

first fluid input port means for effectuating full extension of said ram by pressurizing said primary pressure chamber means and defined within piston center tube means defined within the smaller diameter sweep cylinder;

second fluid input port means separate from said first fluid input means for effectuating sweep cycle extension of said sweep cycle cylinder means;

third fluid input port means for retracting said ram from the fully extended position or for retracting said sweep cycle cylinders;

bridging tube means operationally extending between said end block means and said sweep cycle cylinder means for hydraulically coupling said plurality of said non sweep cycle cylinders with said sweep cycle cylinders, said bridging tube means comprising:

feed tube means extending coaxially from said end block means toward and coaxially receiving piston slider tube means associated with said sweep cycle cylinders;

said slider tube means extending coaxially between said feed tube means and piston center tube means communicating with said first fluid input port means;

said feed and slider tube means defining a separate sweep cycle actuation chamber between their outer peripheries and said sweep cycle cylinder means; and,

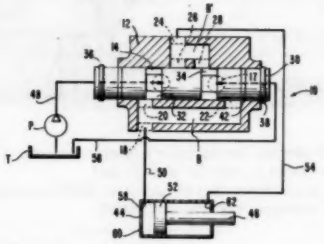
retract tube means disposed internally of the smallest sweep cycle cylinder for receiving said feed tube means during retraction of said sweep cycle cylinders; and, a sweep cycle retract volume being operationally defined between said retract tube means and said piston center tube means.

4,691,618

HYDRAULIC CONTROL VALVE

Denzil C. Poling, Rte. 6, Box 80, Hagerstown, Md. 21740

Filed May 5, 1986, Ser. No. 859,992
Int. Cl.[4] F15B *13/04*
U.S. Cl. 91—326 **26 Claims**



14. In combination:

(i) a hydraulic control valve comprising:

(a) a valve housing including a cylindrical valve bore, the valve housing further including a supply port in the valve housing in communication with the valve bore, a discharge port in the valve housing in communication with the valve bore, a first delivery port in the valve housing in communication with a first blind bore within the valve housing, the first blind bore having first and second openings into the valve bore, and a second delivery port in the valve housing in communication with a second blind bore within the valve housing, the second blind bore having first and second openings into the valve bore;

the hydraulic control valve further comprising:

(b) a valve pin slidable within the valve bore, the valve pin including a first pin groove operable to establish communication between the supply port and either of the delivery ports to the exclusion of the other delivery port, which supply port communication is establishable through corresponding first valve bore openings communicating with respective delivery ports through respective blind bores, and a second pin groove operable to establish communication between the discharge port and either of the delivery ports to the exclusion of the other delivery port, which discharge port communication is establishable through corresponding second valve bore openings communicating with respective delivery ports through respective blind bores;

wherein supply port communication with one of the delivery ports is establishable simultaneously with discharge port communication with the other delivery port; and

(ii) a drive cylinder having ports at opposite ends thereof and housing a hydraulically operated reciprocating piston, one drive cylinder port being connected to the first delivery port of the valve, the other drive cylinder port being connected to the second delivery port of the valve.

4,691,619

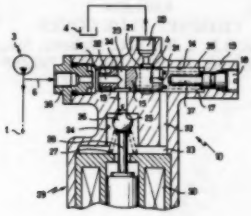
REGULATED DEVICE FOR CONTROLLING FLOW IN A HYDRAULIC INSTALLATION, PARTICULARLY FOR THE ASSISTED STEERING OF A VEHICLE

Gilbert Kervagoret, Argenteuil, France, assignor to Bendix France, Paris, France

Filed Mar. 11, 1986, Ser. No. 838,747
Claims priority, application France, Mar. 13, 1985, 85 03687
Int. Cl.[4] F16K *31/12*; B62D *5/06*
U.S. Cl. 91—459 **6 Claims**

1. A regulated device for controlling fluid in a hydraulic

installation (1, 5), particularly for the assisted steering of a vehicle, comprising a source of pressure (3) through an outlet connected to a system for controlling (1) a hydraulic actuator (5), the device (10) being intended to be interposed in a branch hydraulic line (6) between the outlet of the source of pressure (3) and a reservoir (4) and incorporating a body (13) having a bore (14) in which a modulating slide (15) is slidingly mounted which forms a modulable restriction (s) between an inlet passage (32, 33, 19, 23, 22, 17), which is intended to be connected to the outlet of the source (3), and an outlet passage (20, 21),



which is intended to be connected to the reservoir (4), both passages opening into the bore, (14) position of the slide (15) being determined as a function of an electrical control signal (11) by an electromagnetic control member (29), characterized in that the inlet passage includes a first portion, (32, 33) which is formed in one end of the slide (15) and opens laterally (34) facing a first end (19) of a second passage portion (19, 24, 23, 22) which is formed in the body and the other end (22) of which opens into a closed end (17) of the bore (14), a valve (26) controlled by the electro-magnetic control member (29) being interposed in said second passage portion.

4,691,620

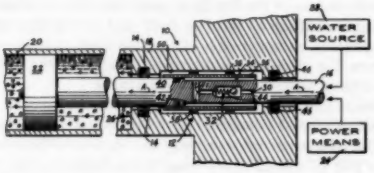
SELF-FLUSHING FLUID SEAL ASSEMBLY

David T. Kao, Lexington, Ky., assignor to Board of Trustees of the University of Kentucky, Lexington, Ky.

Filed Apr. 19, 1985, Ser. No. 725,225

Int. Cl.[4] F15B *21/04*

U.S. Cl. 92—80 **9 Claims**



1. A self-flushing fluid seal assembly to prevent particle intrusion into a seal around a drive shaft of a slurry pump during a return stroke of said pump when a portion of said drive shaft is retracted past said seal comprising:

a variable volume chamber concentrically disposed about the shaft;

means for delivering flushing liquid to said variable volume chamber on a power stroke of said pump when a portion of said drive shaft is extended past said seal;

plunging means for varying the volume of said chamber, said plunging means including a pumping face directed away from said seal for increasing the volume of said chamber and for receipt of flushing liquid on said power stroke and decreasing the volume of said chamber for forcing liquid from said chamber on said return stroke;

the sealing of said seal being effective during the power stroke and the lack of sealing during the return stroke caused by the presence of flushing liquid;

passage means for redirecting liquid received from said variable volume chamber extending in the opposite direction into and through the seal around the shaft to provide a smooth, annular flushing stream that prevents particle intrusion into said seal during pumping, thereby reducing wear.

4,691,621

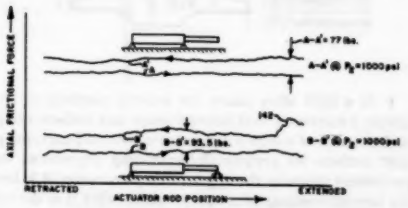
PISTON-AND-CYLINDER ARRANGEMENT WITH RADIALLY-YIELDABLE PISTON HEAD

Larry D. Hall, East Aurora, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,591

Int. Cl.[4] F01B *31/00*

U.S. Cl. 92—184 **23 Claims**



1. In a piston-and-cylinder arrangement having an annular piston head member encircling a portion of an actuator rod member, said piston head member being mounted on said rod member portion for movement axially therewith and radially relative thereto, said piston head member having one end face adapted to be exposed to a first fluid pressure and having an opposite end face adapted to be exposed to a second fluid pressure, the improvement which comprises:

an annular recess provided in one of said members to face the other of said members, said one member having a first surface provided to one side of said recess, having a second surface provided within said recess, and having a third surface provided to the other side of said recess;

an annular lug provided on the other of said members and arranged in said recess, said other member having a first surface provided to one side of said lug and arranged to face said one member first surface, having a second surface provided on said lug and arranged to face said one member second surface, and having a third surface provided to the other side of said lug and arranged to face said one member third surface;

a first seal ring operatively arranged to seal the joint between said first surface;

a second seal ring operatively arranged to seal the joint between said second surfaces;

a third seal ring operatively arranged to seal the joint between said third surfaces;

a first passageway arranged to communicate said second fluid pressure with the annular space between said first and second seal rings;

a second passageway arranged to communicate said first fluid pressure with the annular space between said second and third seal rings;

said first, second and third surfaces being so configured and dimensioned that a fluid pressure acting on either end face of said piston head member will not urge said piston head member to move axially relative to said rod member;

whereby frictional forces opposing radial movement of said piston head member relative to said rod member, will be reduced.

4,691,622
LIGHT ALLOY PISTON

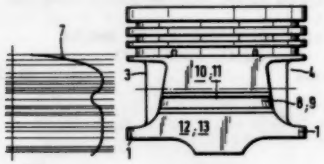
Wilfried Sander, Neckarsulm; Gunder Essig, and Erich Wacker, both of Heilbronn, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 7, 1985, Ser. No. 785,319

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437111

Int. Cl.[4] F16J *1/04*

U.S. Cl. 92—233 **10 Claims**



1. In a light alloy piston for internal combustion engines, having a cambered oval external shape and load-carrying skirt surfaces each of which is divided into two load-carrying partial skirt surfaces by peripherally extending depression, the improvement wherein: the depth of the depression (**8,9**) between the tapered portions of a curved generatrix (**7**) at the top and bottom ends of the skirt is approximately twice the peak-to-valley height of a machined profiled surface of the skirt (**1**), the axial extent of the depression (**8,9**) in an upward and downward direction is so selected that the depression will not protrude from the cylinder when the piston is at its lower dead center and in the cold engine the load-carrying partial skirt surfaces (**10, 11, 12, 13**) have between the upper limit of the depression and the lower limit of the tapered portion of the curved generatrix (**7**) at top end of the skirt an axially parallel portion at a height of 1.5 to 4.5 mm and the load-carrying partial skirt surfaces (**10, 11, 12, 13**) and the depression (**8,9**) are at least as wide as the wear pattern area.

4,691,623
VENTILATOR DEVICE FOR VEHICLE

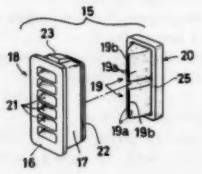
Akira Mizusawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Aug. 21, 1986, Ser. No. 898,960

Claims priority, application Japan, Aug. 27, 1985, 60-129520[U]

Int. Cl.[4] B60H *1/24*

U.S. Cl. 98—2.18 **3 Claims**



1. A two-piece venilator device for use in connection with a vehicle comprising a ventilation frame including a shutter-like grille and a sidewall rearwardly extending from said grille and a one-piece molded frame-like valve member mounted in said side wall and including a check valve for exhausting air from the vehicle to the outside thereof through said grille, wherein:

said valve member has a bill-shaped check valve projecting toward said grille, and an end of the periphery of said valve member and an end of said side wall are provided with respective engagement means for snappingly engaging with each other.

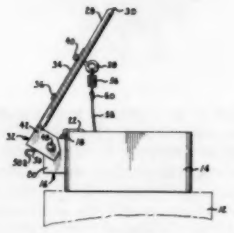
4,691,624
CHIMNEY FLUE COVER

Denny L. Moore, R.R. 2, Box 62C, Moberly, Mo. 65270

Filed Oct. 23, 1985, Ser. No. 790,405

Int. Cl.[4] F23L *17/02*

U.S. Cl. 98—59 **2 Claims**



1. A chimney cap for opening and closing a fireplace chimney flue having a flue liner, comprising:

a mounting bracket having a body portion which includes a substantially flat plate member and a pair of spaced apart side plates integral with said plate member and extending therefrom generally parallel to one another, said mounting bracket also including a plate element oriented substantially parallel to said plate member and a bridge portion integral with and interconnecting said plate member and said plate element, said moutning bracket being applicable to the flue liner with said plate member adjacent an outside surface of the flue liner, said plate element adjacent an inside surface of the flue liner and said bridge portion spanning an upper edge of the flue liner;

means for clamping said bracket rigidly on the flue liner without permanently deforming same;

a cover having a size to cover the flue;

a hinge bracket connected with said cover and including a flat tongue portion overlying and secured to the cover and a pair of spaced apart hinge plates located adjacent said side plates of the body portion of said mounting bracket, said hinge plates terminating in back edges and said hinge bracket also including a rigid flange extending between said back edges of the hinge plates;

a substantially horizontal hinge pin connecting said hinge plates with said side plates in a manner to mount said cover for pivotal movement about the axis of the hinge pin between an open position wherein the flue is open and a closed position wherein the flue is covered by said cover;

a torsion spring soiled around said hinge pin and generally enclosed by said side plates at the ends, said plate member at the front, said flange at the back and said tongue at the top, said torsion spring being loaded in compression when the cover is closed and having opposite ends acting against said plate member and flange, respectively, to continously urge said cover toward the open position; and

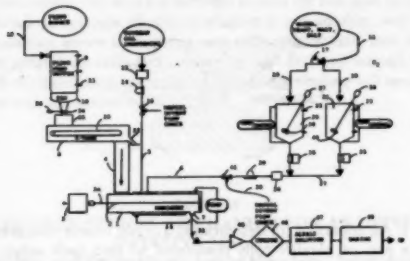
cable means coupled with said cover and extending through the flue into the fireplace for opening and closing the cover.

4,691,625

CONTINUOUS PRETZEL DOUGH MANUFACTURE

William A. Blain, Spring Valley, N.Y., and John Zabrodsky, III, Somerville, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 18, 1984, Ser. No. 621,741
Int. Cl.[4] B01F 15/04; A47J 37/12; B67D 5/62
U.S. Cl. 99—348 10 Claims



1. An apparatus for continuous production of pretzels comprising:

(a) at least one feed source for a variety of raw ingredients to make a dough;

(b) a continuous operating assemblage having a plurality of mixing units and a plurality of conveying units, said mixing units and said conveying units being in a ratio of about 3 to 1, respectively, said assemblage being adapted to receive and mix said raw ingredients into a uniform density dough, said dough being discharged at a steady rate from said assemblage;

(c) a means for extruding said discharged dough;

(d) a means for curing an exterior layer of said discharged dough;

(e) a means for treating said cured dough in an alkali metal hydroxide solution; and

(f) a means for baking said treated dough.

4,691,626

PORTABLE AND SIMPLE BARBECUE SPIT STRUCTURE

Tseng Shih-Cheng, No. 36 Ho-Fong Street, Shih-Lin District, Taipei, Taiwan

Filed Dec. 8, 1986, Ser. No. 939,627
Int. Cl.[4] A47J 37/04
U.S. Cl. 99—421 H 5 Claims

1. A portable and simple barbecue spit structure comprising:

two supporting rods for driving into ground vertically, and the front tip thereof being sharp, while the top ends are formed into a fork respectively;

a spring being movably mounted on said supporting rod;

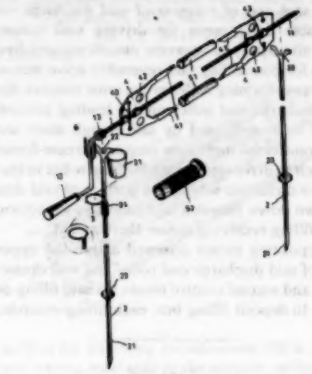
a cup rest;

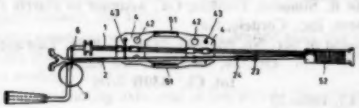
a rotary spit, the body portion thereof being formed into an elliptical shape, and having a hand crank, and in the vertical portion thereof a U-shaped member being welded so as to form into a left and a right hooks;

two forks, both of them being mounted around said rotary spit, and the front points thereof being used for thrusting into the food to be roasted and said forks being furnished with springs respectively.

two protective sleeves for protecting the points of said forks when not in use and a third sleeve for storing the spit and legs when disassembled and placed into a position parallel to each other;

and said barbecue spit structure being arranged for storage or transporting characterized in characterized that said two protective sleeves being mounted on the tips of said two forks respectively to form two handles for carrying convenience; and said two supporting rods being placed adjacent and parallel to said rotary spit, said two supporting rods being stored in said left and right hooks respectively, and said storing sleeve being placed over the ends of





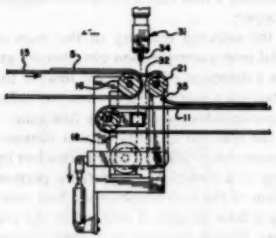
said supporting rods and said rotary spit thereby bundling together said spit structure for carrying convenience and safety.

4,691,627

APPARATUS FOR MAKING FILLED FOOD ARTICLES

Gary F. Roberts, Colona, Ill., assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Jan. 16, 1986, Ser. No. 819,751
Int. Cl.[4] A21C 9/00, 11/00
U.S. Cl. 99—450.6 4 Claims



1. In apparatus for depositing a foodstuff filling on a dough sheet and forming the sheet so as to enclose the filling therein, comprising, dough sheet conveyor means, filling depositing means, and folding means; and wherein filler is deposited on the dough sheet in a crease formed therein and thereafter the dough sheet is folded around the filling; in combination;

a dough sheet feed section of said conveyor means having a discharge end roller rotatable about an axis extending transversely to the direction of movement of said conveyor means and means for rotating said discharge end roller continuously in one direction;

a crease-forming roller adjacent to said discharge end roller having its upper surface disposed at approximately the same elevation as the discharge end of said dough sheet feed section and rotatable about an axis substantially parallel to said axis of rotation of said discharge end roller, reversible drive mean for driving said crease-forming roller alternately in opposite directions, and first control means for controlling said reversible drive means to drive said crease-forming roller in the same rotative direction as said discharge end roller until a leading portion of each dough sheet delivered by said dough sheet section has been transferred therefrom onto said crease-forming roller and then to drive said crease-forming roller in the opposite rotative direction, whereby a portion of said dough sheet is drawn down between said rollers so as to form a transverse filling-receiving crease therein; and,

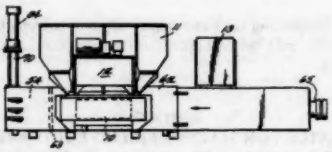
filling depositing means disposed above the opposing surfaces of said discharge end roller and said crease-forming roller, and second control means for said filling depositing means to deposit filling into each filling-receiving crease.

4,691,628

METHOD FOR DEWATERING A MASS OF WET FIBROUS MATERIAL

Edwin K. Simpson, Cordele, Ga., assignor to Harris Press and Shear, Inc., Cordele, Ga.

Division of Ser. No. 861,936, May 12, 1986. This application Oct. 24, 1986, Ser. No. 922,958
Int. Cl.[4] B30B *9/06*
U.S. Cl. 100—37 **3 Claims**



1. A method for dewatering a mass of wet fibrous material, comprising the steps of:

containing a mass of wet fibrous material in a hopper;

selecting a given quantity of the mass of wet fibrous maerial by adjusting a first ram a predetermined distance beneath the hopper;

feeding the selected quantity of the mass of wet fibrous material into a compression chamber by guiding the first ram in a direction of movement toward the compression chamber via a pair of piston rods and cylinders arranged on opposite sides outside of the first ram;

feeding the selected quantity of wet fibrous material from the compression chamber into a press box by a second ram moving in a direction substantially perpendicular to the direction of the movement of the first ram;

lowering a door located at one end of the press box so that the wet fibrous material is pushed thereagainst by the second ram;

compressing the wet fibrous material in the press box by the second ram into a bale;

expressing water from the wet fibrous material being compressed in the press box by the second ram; and

channeling the water expressed from the fibrous material along a plurality of liners arranged on a front face of the second ram, on a rear face of the door, and on a top wall, a bottom wall, and two opposing side walls of the press box;

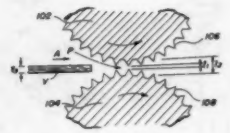
whereby the mass of wet fibrous material is efficiently dewatered from all six sides.

4,691,629

APPARATUS FOR DEHYDRATING CRUDE VENEER

Yoshinori Koba, Kajitacho Ohbushi, Japan, assignor to Meinan Machinery Works, Inc., Kajitacho Ohbushi, Japan

Filed Oct. 25, 1985, Ser. No. 791,359
Claims priority, application Japan, Oct. 30, 1984, 59-229691
Int. Cl.[4] B30B *9/20*
U.S. Cl. 100—121 **20 Claims**



1. An apparatus for dehydrating a crude veneer, comprising:

a pair of parallel rolls positioned to face each other, the veneer being fed toward a predetermined position which is defined between said rolls and coplanar with axes of said rolls in such an orientation that fibers of the veneer extend generally in a longitudinal direction of the veneer with respect to an intended direction of veneer feed;

tooth means provided on a periphery of each of said rolls such that said tooth means on the rolls become aligned with each other at said predetermined position between the rolls, tips of said tooth means on the rolls being spaced from each other at said predetermined position by a distance which is substantially 20–60 percent of a thickness of the veneer;

the peripheries of the rolls except for said tooth means being spaced from each other at said predetermined position by a distance which is at least 90 percent of the thickness of the veneer; and

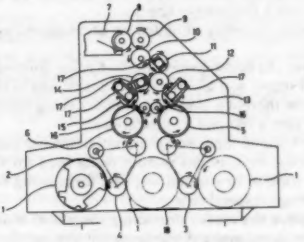
drive means for causing the rolls to rotate in opposite directions to each other.

4,691,630

INK-APPLYING MECHANISM OF A PRINTING MACHINE HAVING A RECIPROCATIVE PRINTING ROLL

Shinzo Asano, Yokohama, Japan, assignor to Asano Tekkosho Co., Ltd. and Fsk Co., Ltd., both of Tokyo, Japan

Filed Mar. 14, 1986, Ser. No. 839,903
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—212 **3 Claims**



1. An ink-applying mechanism for a printing mechanism having a rotative printing roll reciprocative along an onward and a return way in which a first applying roll applies ink during the onward way of the printing roll to a printing face thereof, and a second applying roll applying ink to said printing face during the return way of the printing roll, said first and

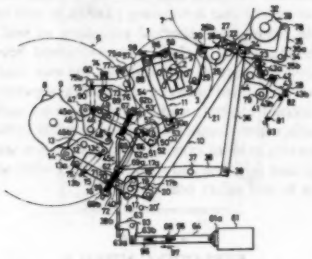
second applying rolls for this purpose being in contact with respective first and second ink rolls rotating in direction reverse to that of the first and second applying roll, said first and second ink rolls being supplied with ink from an ink-container through a single series of associated, sequentially contacting, kneading rolls, a first kneading roll in said series engaging an ink pad for feeding the ink from the ink container to said series of sequentially contacting kneading rolls, a last of said series of kneading rolls, distant from said first kneading roll, comprising a distributing roll which effectively rotates the first and second ink rolls in opposite directions relative to one another, and ink smoothing means comprising two rolls intermediate said first and second ink rolls and contacting said first and second ink rolls for smoothing ink supplied by said distributing roll to said first and second ink rolls.

4,691,631

CYLINDER SETTING MECHANISM FOR AN OFFSET PRINTING MACHINE

Koji Ishii, and Yukito Okuda, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Mar. 25, 1986, Ser. No. 844,031
Claims priority, application Japan, Mar. 26, 1985, 60-63130
Int. Cl.[4] B41F *13/20, 13/28*
U.S. Cl. 101—218 **4 Claims**



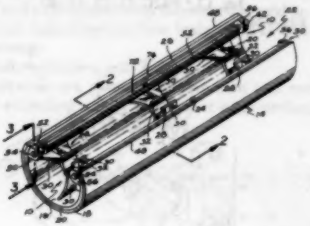
1. A cylinder setting mechanism for an offset printing machine, said offset printing machine comprising a frame, said frame including laterally spaced frame vertical walls, an impression cylinder mounted between said walls for rotation horizontally about a fixed axis on the frame, a plate cylinder mounted for rotation between said walls for rotation about a second fixed axis on the frame, parallel to the axis of rotation of the impression cylinder with the peripheries of the plate cylinder and the impression cylinder spaced from each other, and a rubber blanket cylinder interposed between the pressure cylinder and the plate cylinder, parallel thereto and between said frame vertical walls for peripheral contact with the plate cylinder and the impression cylinder, the improvement comprising, eccentric metal parts rotatably mounted on respective frame vertical walls for rotation about a first axis, an eccentric rubber blanket cylinder shaft extending between said frame vertical walls and mounted for rotation on said eccentric metal parts about an axis eccentric to the axis of rotation of said eccentric metal parts, and means for mounting said rubber blanket cylinder for rotation on said rubber blanket cylinder shaft about an axis which is eccentric to the axis of rotation of said eccentric rubber blanket cylinder shaft and means for selectively, sequentially rotating said eccentric metal parts and said eccentric rubber blanket cylinder shaft for sequentially setting said rubber blanket cylinder into engagement initially with said plate cylinder and subsequently with said impression cylinder in two steps.

4,691,632

METHOD AND APPARATUS FOR ATTACHING ANTI-SMEAR NET TO PRINTING PRESS TRANSFER CYLINDER

Howard W. DeMoore, 10954 Shady Trail, Dallas, Tex. 75220

Filed Jul. 8, 1986, Ser. No. 883,035
Int. Cl.[4] B41F *21/00*
U.S. Cl. 101—426 **20 Claims**



1. A method for attaching an anti-smear fabric web having leading and trailing axial ends to the support surface of a skeleton wheel of the type used in supporting and conveying printed sheets in a printing press and having an opening along the axial width defining a leading edge and a trailing edge of the support surface, the steps of:

providing a reel assembly capable of limited axial movement within the opening adjacent the leading edge of the support surface;

attaching the leading axial end of the web to the reel assembly for limited axial movement therewith; and

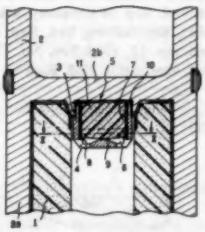
extending the trailing axial end of the web around the support surface and attaching the trailing axial end to the wheel within the opening.

4,691,633

IGNITER INTENDED FOR GAS-GENERATING CHARGES IN SHELLS

Jean-Philippe Godfrin, Plougastel-Daoulas; Bernard Landrevie, Saint-Medard en Jalles, and Gérard Escache, L'Hay-les-Roses, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jun. 6, 1986, Ser. No. 871,557
Claims priority, application France, Jun. 6, 1985, 85 08548
Int. Cl.[4] F42B *13/267;* **F42C** *19/08*
U.S. Cl. 102—202 **12 Claims**



1. Igniter intended for gas-generating charges (1) with a central channel, contained in shells (2), comprising, on the one hand, a strong outer casing (3) whose bottom is equipped with divergent peripheral openings (4) and, on the other hand, an ignition charge (5) placed in this casing, characterized in that the inner surface of the casing comprises a means for axial positioning of the charge which provides a free space (6) between the downstream face of the charge and the bottom of the casing, the ignition charge (5) consisting of a pyrotechnic

block (11) integrally joined to a peripheral sleeve (7) resting on the said means of axial positioning.

4,691,634

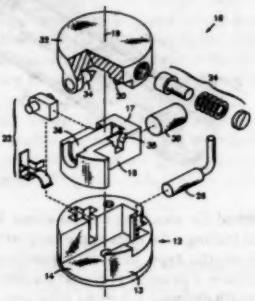
ELECTRO-EXPLOSIVE SAFETY AND ARMING DEVICE

John D. Titus, Phoenix, and Phillip E. Hall, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 19, 1986, Ser. No. 875,910

Int. Cl.[4] F42C *15/22, 15/40*

U.S. Cl. 102—245 **6 Claims**



1. A safety and arming mechanism for fuzes on spinning explosive projectiles and the like comprising:

a base member adapted to be affixed to the projectile;

a firing pin;

a detonator designed to be activated by contact with said firing pin;

one of said firing pin and said detonator being mounted on said base member;

a sliding member slideably mounted on said base member for movement towards one of said firing pin and said detonator from a first position in which said detonator is safe into a second position in which said detonator is armed;

means holding said sliding member in the out-of-line position;

the other of said detonator and said firing pin being mounted on said sliding member; and

actuator means for releasing said sliding member from the first position.

4,691,635

SAFETY FUSE FOR A SPINNING-TYPE PROJECTILE

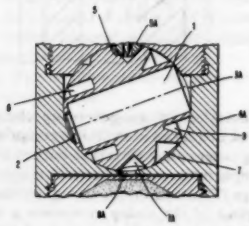
Walter Winterhalter, Tennenbronn, and Andreas Halssig, Denkingen, both of Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,400

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435402

Int. Cl.[4] F42C *15/26*

U.S. Cl. 102—251 **5 Claims**



1. In a safety mechanism for a fuse of a spinning-type projectile, said safety mechanism being of the type comprising a housing having a spherical cavity therein defined by a spherical surface, a spherical rotor rotatably disposed in said spherical cavity, said spherical rotor having a through-chamber therein carrying a detonator, said through-chamber defining a longitudinal axis and including first and second orifices at opposite longitudinal ends thereof, said first and second orifices disposed on a spherical periphery of said spherical rotor in substantially diametrically opposite relationship, said housing including a detonating passage leading to a detonable charge, said spherical rotor including a locking recess engaged by a releasable projection in said housing to lock said spherical rotor in a safety position wherein said first orifice is spaced from said detonating passage in the circumferential direction, said projection disposed diametrically opposite said detonating passage, a first cut-out formed in said spherical rotor periphery adjacent said first orifice to reduce the mass of said spherical rotor, the improvement wherein a second cut-out is provided in said spherical rotor periphery adjacent said second orifice to further reduce the mass of said spherical rotor, said first and second cut-outs being arranged and configured such that no portion thereof overlies said detonating passage when said spherical rotor is in said safety position, each of said first and second cut-outs being annular and extending coaxially relative to said longitudinal axis of said through-chamber, said locking recess disposed between said first an second cut-outs on one side of said spherical rotor, and a passage-covering portion of said spherical rotor periphery being disposed diametrically opposite said locking recess, said passage-covering portion being positioned between said first and second cut-outs and arranged to overlie said detonating passage in said safety position of said rotor, said spherical periphery of said spherical rotor including a first surface area positioned between said passage-covering portion and said first cut-out, and a second surface area positioned between said passage-covering portion and said second cut-out, said first and second surface areas making surface area contact with said spherical surface of said spherical cavity to block communication between said detonating passage and said first and second orifices when said spherical rotor is in said safety position.

4,691,636

EXPLODING MISSILE

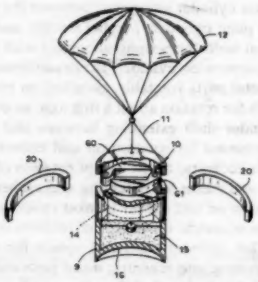
Wolfram Witt; Hendrik Lips, both of Düsseldorf; Herbert Scholles, Meerbusch, and Raimund Schweiger, Munich, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 624,042, Jun. 25, 1984, Pat. No. 4,622,900. This application Jul. 17, 1986, Ser. No. 887,176

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322927

Int. Cl.[4] F42B *13/00, 1/02, 25/02*

U.S. Cl. 102—387 **5 Claims**



1. An exploding missile comprising:

a casing;

means attached to the casing for making it move in a predetermined direction relative to the casing after launch;

a charge in the casing having a projectile-forming front face;

an antenna on the casing behind the front face and charge and displaceable between a retracted position wholly behind the charge and an extended position projecting laterally therefrom and directed at least generally forwardly in the direction past the charge;

actuation means connected between the casing and the antenna for moving same from the retracted into the extended position after launch of the missile; and

control means including a receiver connected to the antenna and a detonator in the charge for detecting the distance to a target in front of the missile and exploding the charge when a predetermined distance is detected.

4,691,637

MODULAR GROUND MINE

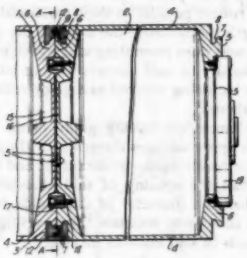
John W. Leigh, Sale, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 6, 1984, Ser. No. 662,987

Claims priority, application United Kingdom, Sep. 9, 1983, 8324179

Int. Cl.[4] F42B *22/06*

U.S. Cl. 102—406 **4 Claims**



1. A naval ground mine comprising at least two modules, each module including a cylindrical casing containing a mass of explosive, each casing being provided with a spigot on an end face thereof, and each spigot being provided with a radially outwardly directed lip,

the mine further comprising a ring having a radially outer surface which conforms substantially without discontinuity to the peripheral contour of the casing at least in the region of the said end face thereof, and a radially inner surface adapted to embrace and hold together the lips on the spigots of adjacent end faces of the two modules,

the ring being capable of being divided circumferentially into distinct segments to permit assembly of the mine, and being provided with fastening means whereby the ring segments can be firmly held together.

4,691,638

CASED TELESCOPED AMMUNITION

David A. Meyer, Plymouth; Brian B. Tasson, Anoka; Robert F. Vollmer, Bloomington, and J. Bruce Warren, Wayzata, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 30, 1985, Ser. No. 729,026

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—434 **4 Claims**

1. A cased telescoped ammunition for use with a gun having a barrel and chamber, said ammunition comprising:

a cylindrically shaped hollow body of resilient relatively thin material, said body having two axial ends and a butt joint extending longitudinally between said axial ends;

lip means integral with said body at each of said axial ends, each said lip means:

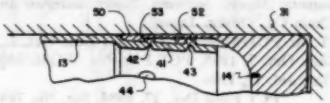
extending axially away from said body with an inward taper to an outboard edge surface having a diameter less than the diameter of said body, and

having a plurality of pairs outwardly extending nipples circumferentially disposed around the outer surface of each said lip means, each of said pairs of nipples comprising an inboard nipple and an outboard nipple; and

a pair of end caps respectively connected to said lip means of said axial ends of said hollow body, each of said end caps comprising:

a radially extending end portion,

a continuous rim portion integral with said end portion and extending axially to an inner edge surface,



axially extending notch means on the inner surface of said axially extending rim portion, said notch means being positioned beginning at a preselected point axially spaced from said inner edge surface and extending axially outboard a preselected distance equal to at least the axial extent of each of said pairs of nipples;

said end caps being connected to said body, as aforesaid, by said rim portion inner edge surface being positioned axially inboard from said inboard nipples and with all of said nipples being disposed in said axially extending notch means, and

said inboard nipples being characterized by being shearable by said rim portions of said end caps upon relative outboard axial movement of said end caps with respect to said body, and

said end caps being thereafter retained in assembled relationship with said body by said outboard nipples.

4,691,639

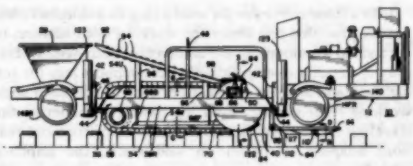
RAIL TIE PLATE PLACING VEHICLE AND METHOD

John D. Holley, Montgomery, Ala., assignor to Holley Engineering Company, Inc., Montgomery, Ala.

Filed Feb. 4, 1986, Ser. No. 826,008

Int. Cl.[4] E01B *29/32*

U.S. Cl. 104—16 **30 Claims**



1. A rail tie plate placing vehicle comprising:

(a) a main frame;

(b) a moving conveyor extending in a closed loop, said conveyor supported by said main frame and operable in a plate placing mode to place tie plates upon ties of a railroad track as the vehicle moves down the railroad track;

(c) a first gate for gating the conveyance of tie plates by said conveyor, said first gate disposable in a blocking state wherein it blocks the conveyance of a leading tie plate and disposable in an open state wherein it allows passage of a leading tie plate for conveyance by movement of said conveyor;

(d) holding means for holding tie plates against said con-

veyor and allowing the release of tie plates at a common predetermined release point on said closed loop for immediate disposal upon a tie; and

(e) a tie detector supported by said main frame for detection of ties at a detection point forward of said release point; and

wherein said tie detector causes said first gate to open for passage of a tie plate corresponding to the detection of a tie such that the tie plate which was allowed passage by said first gate arrives at said release point when said vehicle has moved said release point over the detected tie.

4,691,640

AUTOMOTIVE BODY, FLOOR CONVEYOR, HAVING PIVOTAL CARRIERS

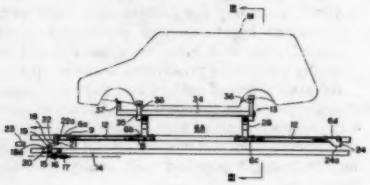
Masasumi Murai, Saitama, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

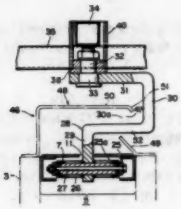
PCT No. PCT/JP84/00627, § 371 Date Oct. 7, 1985, § 102(e) Date Oct. 7, 1985, PCT Pub. No. WO86/04029, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 27, 1984, Ser. No. 789,306

Int. Cl.[4] B61B *10/00*

U.S. Cl. 104—140 **9 Claims**





1. In a floor conveyor for conveying an automotive body on a track provided just under the working floor surface, including a stand for mounting the automotive body with its center of gravity directly overlying said track, support legs for supporting the stand at front and rear portions of the stand above the working floor surface, each leg having a carrier comprising traveling rollers with horizontal axes at its front and rear portions adapted to travel on said track, the improvement wherein:

the track comprises a pair of laterally-spaced channel members having their channels facing one another to receive the traveling rollers therein, the vertical height of said channels affording limited vertical displacement of said rollers in the respective channels when the automotive body sways from side to side, the spacing of said channels being greater than the sideward fluctuation of said center of gravity when said body sways;

said support legs being mounted at their lower ends on said carriers by axles positioned between said front and rear traveling rollers parallel to their rotational axes and having a length substantially the same as the spacing of said channels, said axles permitting said legs to pivot forwardly and rearwardly on said carriers but not laterally;

each carrier including vertical-axis guide rollers at the front and rear thereof;

said channel members having guide plates oppositely arranged on upper surfaces thereof providing therebetween a guide slot receiving the guide rollers and having a width smaller than the spacing of said channels and slightly greater than the diameter of said guide rollers so as to guide the carriers to maintain the traveling rollers within the channels of said channel members.

5. A painting booth with a floor conveyor for conveying an automotive body over a working floor surface,

a track provided just under the floor surface,

a stand for mounting the automotive body with its center of gravity directly overlying said track,

support legs at front and rear portions of the stand for supporting the stand above the working floor surface, each leg having a carrier comprising traveling rollers with horizontal axes at its front and rear portions adapted to travel on said track,

said track comprising a pair of laterally-spaced channel members having their channels facing one another to receive the traveling rollers therein, the vertical height of said channels affording limited vertical displacement of said rollers in the respective channels when the automotive body sways from side to side, the spacing of said channels being greater than the sideward fluctuation of said center of gravity when said body sways,

said support legs being mounted at their lower ends on said carriers by axles positioned between said front and rear traveling rollers parallel to their rotational axes and having a length substantially the same as the spacing of said channels, said axles permitting said legs to pivot forwardly and rearwardly on said carriers but not laterally,

each carrier including vertical-axis guide rollers at the front and rear thereof,

said channel members having guide plates oppositely arranged on upper surfaces thereof providing therebetween a guide slot receiving the guide rollers and having a width smaller than the spacing of said channels and slightly greater than the diameter of said guide rollers so as to guide the carriers to maintain the traveling rollers within the channels of said channel members.

4,691,641

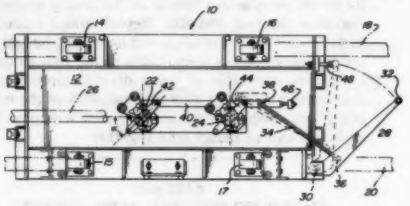
VEHICLE ACCUMULATION SYSTEM

Peter Rohrbach, Bath, and William Benzak, Bethlehem, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Feb. 21, 1986, Ser. No. 831,767

Int. Cl.[4] B61B *13/12*

U.S. Cl. 104—166 **9 Claims**



8. A driverless vehicle of the type propelled along a track by contact between a drive wheel and a rotating drive shaft, the vehicle comprising:

a body;

support wheels adapted to ride on the track, said support wheels being mounted on and supporting the body;

a swing arm pivotably attached to one end of the body for pivoting about a fixed pivot axis on said body, said swing arm forming a bell crank and mounted for extension away from the body end;

means for rotatably supporting the drive wheel on said body for movement of said wheel about a vehicle axis;

means for connecting the swing arm and the drive wheel support means, said connecting means adapted to rotate the support means about its vertical axis in response to a corresponding pivoting motion of the swing arm;

means for biasing the swing arm to extend away from the body end;

means to limit the extension of the swing arm, said extension limiting means adapted to position the drive wheel in a vehicle maximum speed condition with respect to the drive shaft upon full extension of the swing arm;

means to limit the pivoting motion of the swing arm towards the body, said pivot limiting means adapted for selective adjustment such that the drive wheel may cause either decelaration of the vehicle with respect to its full extension position, accumulation of the vehicle along the track, or reverse movement of the vehicle with respect to the full extension position.

4,691,642

MULTICABLE CABLE-CAR OR GONDOLA LIFT

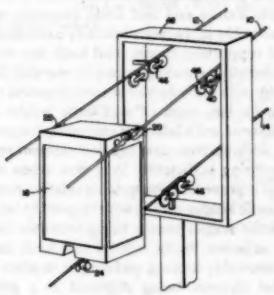
Denis Creissels, Allée de la Piscine, 38700 Corenc, France

Filed Oct. 30, 1985, Ser. No. 792,891

Claims priority, application France, Nov. 2, 1984, 84 16839

Int. Cl.[4] B61B *7/04*

U.S. Cl. 104—173.1 **11 Claims**



1. Multicable passenger transport installation, notably a cable-car or gondola lift, having several aerial cables extending along parallel trajectories between two stations having loading and unloading platforms, comprising:

several vehicles or cars without hanger arms moving between the stations on the line defined by the cables,

at least two pivots borne by each vehicle and extending horizontally and transversely to the longitudinal direction of the cables,

two of said cables exending laterally along each vehicle being spaced apart transversely in relation to the direction of the cables and being spaced apart in height, the trajectories of said two cables being deduced one from the other by translation,

support parts pivotally mounted on said pivots for free movement in a vertical plane,

two grips, one borne by each of said support parts for coupling to the cables to move each vehicle on the line, the vehicles being stabilized in the rolling direction by the laterally spaced cables,

a device driving said two cables in synchronism to stabilize the rocking and the pitching of the vehicles driven in translation, to compensate for the absence of hanger arms.

4,691,643

ROPE COUPLING CARRIAGE HAVING CONCAVE TRACK BETWEEN GRIPS

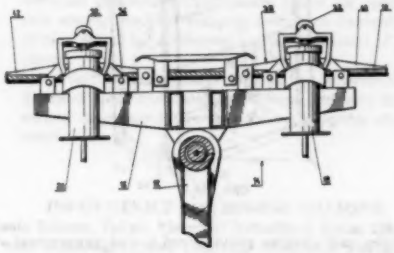
Max Brochand, Noyarey, France, assignor to Pomagalski, Fontaine, France

Filed Sep. 3, 1986, Ser. No. 903,238

Claims priority, application France, Sep. 9, 1985, 85 13450

Int. Cl.[4] B61B *12/12*

U.S. Cl. 104—202 **6 Claims**



1. A carriage, coupling loads, notably cars, to an aerial rope of a transport installation having support and compression sheave batteries with successive sheaves separated by a first distance along a line formed by said rope, said carriage comprising two grips set apart by a second distance, each grip having a pair of jaws mounted astride and gripping the rope with a protruding part of limited thickness above an upper face of the rope for the grip to pass easily under the compression sheave batteries, and a running track extending said protruding part on both sides thereof on the rope, to facilitate entry and exit of the grip under a compression sheave, a part of the running track located between the two grips presenting at both ends a maximum thickness appreciably equal to the thickness of said protruding part so as to just reach the same level as the protruding part above the rope in the grip connection area and a general upward-facing concave shape with a minimum thickness in a middle portion between the two grips.

4,691,644

FRAME STRUCTURE ESPECIALLY FOR A CABINET, E.G. OF THE SHELVED TYPE

Georges Frydman, 70 avenue Auguste Galtier, 06230 Villefranche-sur-Mer, France

Continuation of Ser. No. 532,610, Sep. 15, 1983, abandoned. This application Nov. 4, 1985, Ser. No. 794,439

Claims priority, application France, Sep. 20, 1982, 82 15799

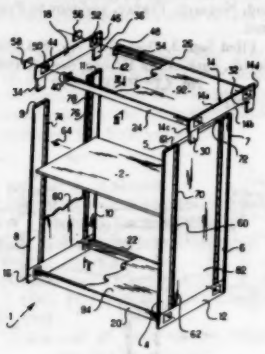
Int. Cl.[4] A47B *47/00*

U.S. Cl. 108—111 **18 Claims**

1. A rigid frame structure especially for a cabinet or like piece of furniture, e.g. of the shelved type, comprising normally vertical uprights maintained laterally spaced from one another by single piece, normally horizontal, lateral yokes, and longitudinally-spaced, normally horizontal, longitudinal cross-members, said yokes comprising outwardly protruding tenons arranged substantially in the longitudinal plane of a respective yoke and substantially perpendicularly to the longitudinal edges of said respective yoke, said tenons adapted to be inserted or fitted into corresponding sockets provided at ends of said vertical uprights, said yokes having vertcal longitudinal faces which are each provided, in proximity to the lateral edges of said yokes, with assembling means for assembling said longitudinal cross-members on said vertical longitudinal faces of said yokes,

said assembling means comprising four cavities disposed on each yoke, two cavities being disposed on each vertical longitudinal face thereof, and each cavity being disposed on said vertical longiduinal face of said yoke substantially

opposite to a cavity disposed on said opposite vertical longitudinal face of said yoke,



whereby said cavities provide end-to-end engagement of additional cross-members for a second frame structure or alternatively, are adapted to be fitted with an end cap for an anchoring engagement.

4,691,645

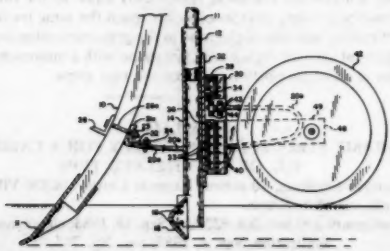
SEED PLANTER ATTACHMENT

Steven Anderson, Star Route, Arlington, Oreg. 97812

Filed Jul. 5, 1985, Ser. No. 752,036

Int. Cl.[4] A01C *5/08*

U.S. Cl. 111—86 **7 Claims**



1. A seed planter, for attachment to a vertically oriented plow shank, comprising:

(a) a plow shank;

(b) a hollow seed guide having a ground engaging boot;

(c) leaf spring rod means coupled to said plow shank for supporting said seed guide in rear trailing relation relative to said plow shank;

(d) a bracket means;

(e) wheel means, said wheel means and said leaf spring rod means connected to said bracket means at a predetermined vertical height relative to said plow shank, said bracket means vertically supporting said seed guide; and

(f) said bracket means including means for selectively detachably coupling to said seed guide at predetermined vertical intervals along the length thereof for connecting said wheel means and said leaf spring rod means to said seed guide, whereby said boot may be regulated in vertical heighth independently of the connection of the wheel means and the leaf spring rod means.

4,691,646

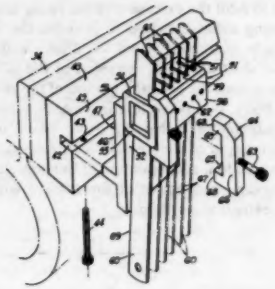
KNIFE HOLDER FOR TUFTING MACHINE

Joseph L. Card, and Roy T. Card, both of Chattanooga, Tenn., assignors to Card-Monroe Corporation, Chattanooga, Tenn.

Filed Jun. 29, 1983, Ser. No. 508,853

Int. Cl.[4] D05C *15/24*

U.S. Cl. 112—80.6 **12 Claims**



1. A tufting machine of the type having needles for inserting yarns through a backing material and wherein a plurality of laterally spaced loopers catch and hold the loops of yarns as they are inserted through backing material by the needles, and a knife assembly supporting means is reciprocated for moving knives for cutting action with respect to the loops caught by the loopers; wherein the improvement comprises: a knife assembly between said knives and said knife assembly support means, said knife assembly including a laterally extending knife bar carried by said supporting means, said knife bar having a sidewise opening laterally extending recess in one side thereof, a plurality of side-by-side knife holder means disposed on said one side of said knife bar, each of said knife holder means having a bracket element and a laterally extending tongue fixed to and protruding sidewise from said bracket element into said recess, said tongue being sufficiently long that when it is received in said recess it prevents appropriable relative rotational movement of said knife holder means with respect to said knife bar, each of said knife holder means being movable into and out of its position adjacent to one side of said knife bar, and detent means for removably locking said tongue in place in said recess, said bracket element being disposed in a generally horizontal plane and having a plurality of equally spaced parallel slots, said slots being disposed at an acute angle to the horizontal plane of said bracket element and respectively receiving said knives therein for holding said knives with their cutting edges against and cooperating with said loopers.

4,691,647

OPTICAL THREAD BREAKAGE MONITORING APPARATUS

Walter von Stein, Waldkirch, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,377

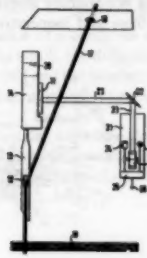
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539536

Int. Cl.[4] D05C *15/08, 15/18*

U.S. Cl. 112—80.18 **10 Claims**

1. Optical thread breakage monitoring apparatus for tufting machines comprising a laser beam scanning device which generates a laser beam which executes a continually repeating rapid scanning movement perpendicular to the needles of the needle row and which, when it impinges onto a retroreflecting strip arranged behind the threads being worked by the needles,, as a result of a thread breakage or as a result of passing through the thread gaps, is reflected back on itself and is inci-

dent in the laser beam scanning device on a photoreceiver connected to an electronic processing circuit which, in the event of a change of the normally present periodic signal



generates a fault signal, characterised in that the retroreflecting strip (**11**) is secured above the eyes (**12**) of the needles (**13**) to the front side of the needle beam (**14**).

4,691,648

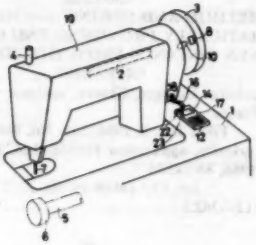
DEVICE FOR DETECTING THE RESIDUAL AMOUNT OF BOBBIN THREAD IN A LOCK STITCH SEWING MACHINE

Tokuzo Hirose, Osaka, Japan, assignor to Hirose Manufacturing Company, Limited, Osaka, Japan

Continuation of Ser. No. 760,978, Jul. 31, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 928,592

Int. Cl.[4] **D05B** *19/00, 69/36*

U.S. Cl. 112—121.11 **1 Claim**



1. A device for detecting the residual amount of bobbin thread in a lock stitch sewing machine comprising:

a first means for detecting the number of rotations of an arm shaft of said sewing machine and for providing an output corresponding to the detected number of rotations, said first means comprising a light emitter disposed on a housing of said sewing machine and a light detector which is also disposed on said housing for detecting said light emitted from said light emitter after being reflected off of an optical reflector disposed on a side portion of a pulley affixed to said arm shaft;

a second means for detecting the residual amount of bobbin thread wound on a bobbin in a bobbin case based on said output of said first means and for comparing said detected residual amount of bobbin thread with a first predetermined value, said first predetermined value being predetermined in dependence upon the conditions of a thread and needle employed and of a workpiece, said second means causing said sewing machine to stop operating when said detected residual amount of bobbin thread reaches said first predetermined value;

said second means comprising an indication element consisting of at least one of a light emitting indication element and a sounding means which is activated when said second detected residual amount of bobbin thread reaches a second predetermined value which is larger than said first predetermined value at which said lock stitch sewing machine is caused to stop operating;

wherein said indication element remains activated until said detected residual amount of bobbin thread reaches said first predetermined value at which said lock stitch sewing machine is caused to stop operating;

wherein said second means further comprises a counter for counting said output of said first means and a key input means for manually inputting said first and second predetermined values and a processing means for controlling said sewing machine and said indication element and a display means for displaying a residual amount of bobbin thread;

wherein said second means is disposed in a separate housing disposed apart from said first means and said first and second means are interconnected via a flexible electrical wires.

4,691,649

INPUT DEVICE FOR SEWING MACHINE

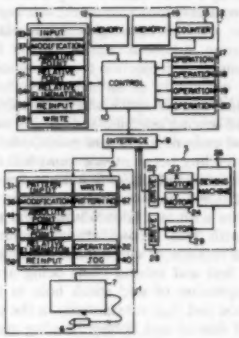
Kunio Takano, Tokyo; Masanori Nukushina; Yoichi Okiyama, both of Kanagawa, and Toshiyuki Miyamoto, Tokyo, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Jul. 24, 1985, Ser. No. 758,657

Claims priority, application Japan, Jul. 31, 1984, 59-160781

Int. Cl.[4] **D05B** *21/00*

U.S. Cl. 112—121.12 **4 Claims**



1. An apparatus for use with a sewing machine for and modifying a sewing pattern to be sewn on a workpiece, said apparatus comprising:

sewing pattern inputting means for inputting coordinate values of a sewing pattern to be sewn on the workpiece;

modification type indication means for indicating absolute point modification of an inflection point in the inputted sewing pattern;

first means for inputting coordinate values of a modification point to replace the coordinate values of the inflection point to be modified;

second means for making visible a portion of the sewing pattern by an inflection point immediately before the inflection point to be modified; and

sewing pattern modification means for modifying relative coordinate values of each of the sewing points between the modification point and an inflection point immediately before the inflection point to be modified in accordance with coordinate values of the modification point and the inflection point immediately before the inflection point to be modified and for modifying the relative coordinate values of each of sewing points between the modification point and an inflection point immediately after the inflection point to be modified in accordance with coordinate

values of the modification point and the inflection point immediately after the inflection point to be modified.

4,691,650

LOCKSWITCH SEWING MACHINE HAVING A ROTARY HOOK

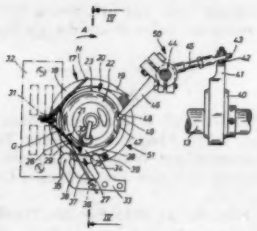
Albert Dusch, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,649

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446547

Int. Cl.[4] D05B *57/08, 57/26*

U.S. Cl. 112—231 **2 Claims**



1. A rotary hook arrangement for a lockstitch sewing machine, comprising a stitch plate having a stitch hole therein, a hook housing rotatably mounted on the sewing machine below said stitch plate, a bobbin housing freely rotatably supported in said hook housing, a bobbin capsule carrier forming part of said bobbin housing, a projection formed on said bobbin housing extending outwardly of an outer periphery thereof and having first and second space abutment surfaces, a carrier mounted on the sewing machine and having two spaced apart first and second cams adjacent said projection, a spring rod on said carrier extending between said cams and engaged against said first abutment surface, said first abutment surface cooperating with said first cam to secure said bobbin housing against forward rotation with said hook housing and said second cam cooperating with said second abutment surface to secure against reverse rotation of said bobbin housing with said hook housing, said first and second cams being arranged substantially at 90° upstream of said stitch hole in the direction of forward rotation and thus substantially in the central region of a loop cast-off side of said bobbin housing and receiving said spring rod therebetween, said first cam providing reinforcement for said spring rod, said projection abutment surfaces formed by side faces of said projection extending tangential to the outer periphery of said bobbin housing and defining a shoulder of said bobbin housing.

4,691,651

TILTABLE SEWING HEAD AND UNDERARM FOR A SEWING MACHINE USED IN CONJUNCTION WITH A WORKPIECE SUPPORTING CARRIER PLATE

Hubert Jünemann, Bielefeld, Fed. Rep. of Germany, assignor to Kochs Adler AG, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,049

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518474

Int. Cl.[4] D05B *75/00, 39/00*

U.S. Cl. 112—259 **12 Claims**

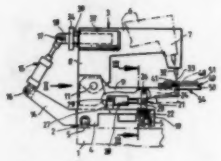
1. Sewing head for a sewing machine with a supporting device for said sewing head; and with a carrier for a workpiece to be stitched, said sewing head and said carrier being displaceable relative to each other, said sewing head comprising:

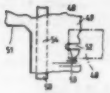
a standard;

an upper arm and an underarm arranged at said standard; a drivable arm shaft pivoted in said upper arm; a needle bar with a needle reciprocatingly drivable by said armshaft; a tubular stud formed at said underarm and into which said needle immerses;

said sewing head having an inoperative position and a working position for stitching;

said sewing head being horizontally displaceable during the movement thereof from said inoperative position to said working position;





an area of obstacle to said tubular stud reached during horizontal displacement of said sewing head

a device for downward tilting said underarm about an axle arranged in the area of said standard; and said device being for removing said tubular stud beyond said area of obstacle.

4,691,652

METHOD AND SEWING MACHINE FOR AUTOMATICALLY PROVIDING END OF STITCHING AT A GIVEN DISTANCE FROM THE EDGE OF A PIECE OF FABRIC

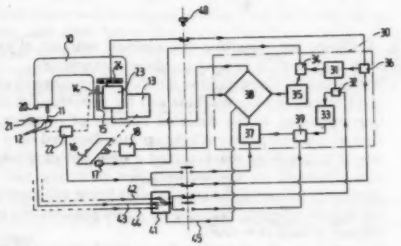
Charly Leclaire, Dourges, France, assignor to Prouvost S.A., Nord, France

Filed Jun. 3, 1986, Ser. No. 869,915

Claims priority, application France, Jun. 3, 1985, 85 08316; Mar. 28, 1986, 86 04534

Int. Cl.[4] D05B *19/00, 27/22*

U.S. Cl. 112—262.1 **9 Claims**



1. A method for automatically carrying out, from a given signal, an end stitching portion of constant length (L) in one travel direction or in the opposite direction, on a sewing machine (**10**) having a device (**14**) for adjusting the length of the stitch, characterized in that it consists in storing, by recording a manual operation for forming at least said end portion (L), the number of pulses delivered, from the appearance of said signal until the end of the operation, by means of a coding device (**22**) delivering a pulse per fraction of the length of the stitch travelled by the fabric in one of the two opposite travel directions and, during reproduction, controlling from the

appearance of said signal the execution of the end part (L) of said stitching by means of a central control unit (30) which

compares the number of pulses recorded with the number of pulses read from said coding device (22) during reproduction,

orders for execution of a complete stitch as long as, at the beginning of the stitch, the difference between the number of pulses recorded and the number of pulses read is greater than the number of pulses corresponding to a complete stitch, and

controls the device for adjusting the length of a stitch and the execution of the last reduced stitch when said difference is less than said number of pulses of a whole stitch.

4,691,653

SEWING MACHINE CONTROL APPARATUS

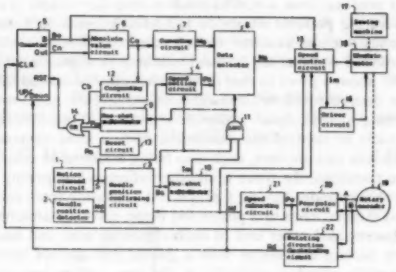
Shigeo Neki, Osaka; Kenichi Ohara, Hirakata; Nobuho Shibata, Katano, and Takashi Dohi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 4, 1986, Ser. No. 926,534

Claims priority, application Japan, Nov. 6, 1985, 60-248214

Int. Cl.[4] D05B *69/24*

U.S. Cl. 112—275 8 Claims



1. Sewing machine control apparatus comprising:

an electric motor for driving a sewing machine,

a rotary encoder connected to said electric motor for generating pulse signals corresponding to revolution of said electric motor,

speed setting means for setting revolution speed of said electric motor,

speed control means for controlling said revolution speed of said electric motor in compliance with setting value of revolution speed set by said speed setting means,

rotating direction discriminating means for detecting rotating direction of said electric motor,

counting means for summing or deducting the number of pulse signals corresponding to output signals of said rotating direction discriminating means,

comparating means for comparing and for detecting coincidence of data of said counting means and a predetermined value thereby to reset said counting means,

converting means for converting said data of the counter to the setting value, and

switching means for selecting an output of said speed setting means in a rotating state of said electric motor and for selecting an output of said converting means in a state of stop of said electric motor.

4,691,654

LATERAL MOVEMENT FEED DOG FOR A SEWING MACHINE

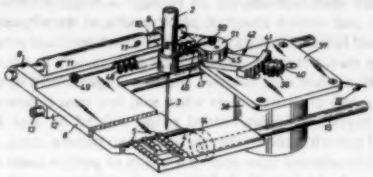
Willi Meier, Karlsruhe, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,277

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531630

Int. Cl.[4] D05B *27/00*

U.S. Cl. 112—303 5 Claims



1. In a sewing machine which includes a reciprocating needle and a feed dog for moving material through a feed path taking it past the needle, the improvement comprising a lateral feed mechanism including a support carrying the feed dog, means mounting said support for lateral movement, said support having a drive surface, a link pivotally mounted adjacent said drive surface and having an eccentric portion in engagement with said slide surface, slide drive means connected to said link to pivot said link so as to rotate said eccentric portion to cause lateral shifting of said support.

4,691,655

MECHANISM FOR PRODUCING STITCHED PATTERNS IN A ZIGZAG SEWING MACHINE

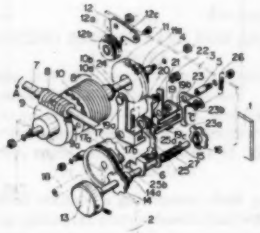
Yasuro Sano, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,817

Claims priority, application Japan, Jan. 14, 1985, 60-2344[U]; Jan. 21, 1985, 60-5459[U]

Int. Cl.[4] D05B *3/02, 3/06*

U.S. Cl. 112—466 5 Claims



1. A zigzag sewing machine including a drive shaft rotated to vertically reciprocate, pattern cams, and a needle which is operatively connected to the pattern cams and is swingable laterally of a fabric feeding direction under the control of the pattern cams, the sewing machine further comprising a cam shaft; said pattern cams including a first group of pattern cams rotatably mounted on the cam shaft and operatively connected to said drive shaft to be rotated thereby at a first predetermined reduced speed, and a second group of pattern cams rotatably mounted on said cam shaft and operatively connected to said first group of the pattern cams to be rotated thereby at a second predetermined reduced speed; transmission means including a swingable member (19) positioned between said first and

second group of said pattern cams and said swingable needle and operatively connected to said needle; cam follower means including a first cam follower (**20**), a guide shaft (**5**), and a second cam follower (**21**) swingably mounted on said guide shaft, which is arranged between said first and second group of the pattern cams and said swingable member (**19**), each of said first and second cam followers having one end for engaging a selected one of said first and second group of pattern cams and an opposite end for engaging said swingable member; pattern selecting means operated to move said first cam follower along said guide shaft substantially all through a range defined by said first and second group of pattern cams to thereby select one of said first and second groups of pattern cams, said pattern selecting means moving said second cam follower in association with said first cam follower within a range defined by said second group of pattern cams when said first cam follower is moved beyond a predetermined range defined by said first group of pattern cams, to thereby select two pattern cams, one of which is selected from said first group of pattern cams and the other of which is selected from said second group of pattern cams; and means for connecting said first cam follower to said second cam follower when said first cam follower is moved beyond said predetermined range defined by said first group of the pattern cams.

4,691,656

FLOATING DOCK CONSTRUCTION

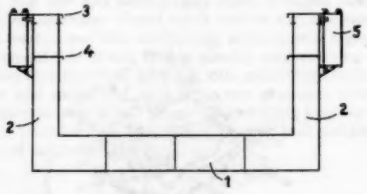
Helmut Katernberg, Oberhausen, and Ingolf Köhler, Wesel-Blumenkamp, both of Fed. Rep. of Germany, assignors to M.A.N.Maschinenfabrik Augsburg-Nurnberg, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,898

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 8436853[U]

Int. Cl.[4] B63C *1/02*

U.S. Cl. 114—45 **1 Claim**



1. A floating dock, comprising a pontoon base, a side wall made up of individual closed portion extending upwardly from each side of said base, and a plurality of detachable buoyancy containers disposed on the outside of each side wall, said side walls including substantially rectangular tank portions temrminating in an upper deck at each top and a deck spaced below each upper deck defining a safety deck, said detachable buoyancy container each comprising a box secured to said side walls between said upper deck and said safety deck, upper and lower eyelets fixed to each side wall for each buoyancy container, an upper and lower eyelet fixed to each buoyancy container, said upper and lower eyelets of said container being aligned respectively with said upper and lower eyelets of one of said saide walls, and bolt elements extending through said aligned upper and lower eyelets for detachably connecting said buoyancy containers to said side walls and for permitting pivoting of said buoyancy containers on said side walls.

4,691,657

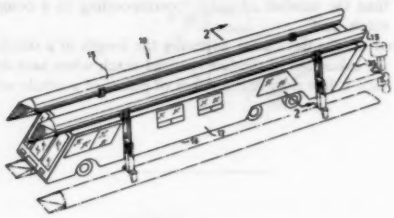
AMPHIBIOUS VEHICLE

Andrew J. Kovac, 4474 Shelby Crescent, Mississauga, Ontario, Canada L4W 3T3

Filed Jul. 16, 1986, Ser. No. 885,844

Int. Cl.[4] B63B *1/00*

U.S. Cl. 114—61 **2 Claims**



1. An amphibious vehicle having a front, a rear and two sides, comprising:

a frame provided with wheels for transporting the vehicle on land;

a body attached to the frame, the body having a watertight lower portion enabling the vehicle to float in a body of water;

pontoons for the vehicle to provide flotation of the vehicle in a body of water, the vehicle having at least one pontoon positionable laterally along each side thereof; and

at least two pivoting arms for moving each laterally extending pontoon from a stowed position atop the vehicle to an operating position alongside the vehicle, each said arm having one end attached to the pontoon and the other end provided with means for moving the arm approximately 180° about a pivot so that the pontoon may be moved into the desired position, the means for moving the arm comprising at least three hydraulic cylinders situated in the vehicle to control the movement of two arms disposed opposite one another, each arm being attached to one of the pontoons, the three hydraulic cylinders comprising a double cylinder having a piston rod extending from each end thereof, each said piston rod being pivotally attached adjacent said other end of each opposing arm, and each arm having a cylinder with a piston rod thereof being pivotally attached centrally of the arm portion between the pivot for the arm and said other end thereof with the other end of the cylinder being pivotally located to enable the cylinder to apply force to the arm substantially throughout its 180° range of movement, said double cylinder and said cylinders associated with the opposing set of arms being operable in concert to move both arms simultaneously and smoothly through their 180° ranges of movement.

4,691,658

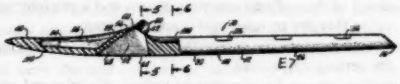
AQUATIC SPORT DEVICE

Dane S. New, 4143 Devon Cir., Cypress, Calif. 90630, and Albert W. Dove, 367 Newport Glen Ct., Newport Beach, Calif. 92660

Filed Jun. 6, 1986, Ser. No. 871,480

Int. Cl.[4] B63B *35/00*

U.S. Cl. 114—66 **4 Claims**



3. An aquatic sport device comprising:

a lighter than water paddle board having a bow, a stern and

a sealable storage compartment therein sized for the storage of a wet suit, a sight compartment disposed aft of said storage compartment, and a deck portion disposed between said sight compartment and the paddle board stern and sized to accommodate a user in a prone position thereon;

means defining a topside portion of said paddle board and forming a top portion of said sight compartment for mounting a first transparent member at an elevated position above the paddle board deck portion and in an angular relationship therewith, said angular relationship enabling a user in a prone position on said paddle board deck portion to look forwardly into the sight compartment towards the bow of the paddle board;

a second transparent member, flush mounted in a hull of the paddle board and forming a bottom portion of said sight compartment, said second transparent member being larger than said first transparent member, said first and second transparent members being aligned with one another to enable a user, in a prone position on the paddle board deck portion, to look through the sight compartment and the paddle board in a downwardly and forwardly direction,

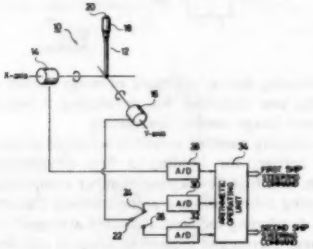
fairing means disposed on the buoyant board hull for guiding bubbles, foam and debris away from the second transparent member disposed in the hull when the buoyant board is floating in water and moved in a forward direction, said fairing means comprising a pair of vanes disposed in a V-like relationship with an intersection of the vanes being disposed proximate the bow of the buoyant board and said second transparent member between disposed said vanes.

4,691,659

APPARATUS FOR STEERING JOYSTICK OF SHIP

Kimiaki Ito; Tetsuo Ueno; Koichi Ueno, all of Yokohama, and Susumu Ishii, Tokyo, all of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 879,041
Claims priority, application Japan, Jul. 6, 1985, 60-148483
Int. Cl.[4] B63H *25/00*
U.S. Cl. 114—144 R **5 Claims**



1. A joystick ship steering apparatus for use in steering of a ship equipped with a propelling equipment for generating a thrust in the back and forth directions, a rudder for changing the direction of the thrust of said propelling equipment, and a propelling equipment for generating a thrust in the lateral direction, said apparatus comprising:

a joystick unit having a joystick lever which can be freely operated around three X, Y, and Z axes;

first rotation angle detecting means for detecting an angle of rotation around the X axis by said joystick lever;

second rotation angle detecting means for detecting an angle of rotation around the Y axis by the joystick lever;

a push button switch provided at the edge of the joystick lever; and

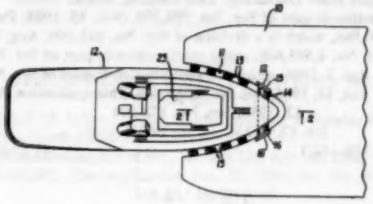
arithmetic operating means for calculating the operating direction and an amount of operation of the joystick lever from detection outputs of said first and second rotation angle detecting means when said push button switch is not operated, and for calculating the operating direction and the amount of operation of the joystick lever from the detection output of either one of said first and second rotation angle detecting means when said push button switch was operated.

4,691,660

TUG/BARGE APPARATUS

Edmund Tornay, New York, N.Y., assignor to Energy Transportation Group Inc., New York, N.Y.

Filed May 12, 1986, Ser. No. 862,037
Int. Cl.[4] B63B *35/70*
U.S. Cl. 114—248 **3 Claims**



1. In combination a barge having formed in the stern thereof a notch shaped to accomodate the stern of a tug therein,

a coupling member having positive buoyancy and mounted in slots formed in said notch so that it spans said notch and floats substantially at the barge water line so as to be able to rise and fall in relation to the barge, and

a tug positioned within said notch in the barge and having means cooperable with said coupling member for coupling the tug to the barge,

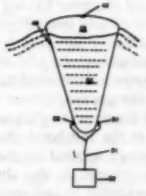
said coupling means comprising a socket in the bow of the tug conforming generally to the shape of said coupling member, said socket extending transversely of the tug and having a forwardly open, transversely extending slot therein to facilitate entry of said barge coupling member thereinto.

4,691,661

SELF-ADJUSTING BREAKWATER FOR ARTIFICIAL HARBORS

Salvatore Deiana, #307-450 North Nanaimo Street, Vancouver, British Columbia, V5L 3G8, Canada

Continuation-in-part of Ser. No. 378,174, May 14, 1982, Pat. No. 4,487,151. This application Sep. 27, 1984, Ser. No. 654,900
Claims priority, application Canada, May 15, 1981, 377683
Int. Cl.[4] E02B *3/06*
U.S. Cl. 114—267 **6 Claims**



1. For use in a artificial breakwater an extensible and flexible walled sealed bag of which a major part is to be submerged below the surface of the sea, at least one anchor fixed by a cable to the bottom of the bag, the bag being filled mostly with water and partly by air, whereby at least a part of the air filled

portion extends above the surface of the sea, the extensibility of the bag being such that in the presence of waves or troughs between waves its vertical dimension dynamically can increase or reduce thereby impeding transmission of wave energy at and below the surface therethrough, the bag being divided into a plurality of sealed compartments isolated from each other by impermeable extensible and flexible walls, and a plurality of anchors are fixed by separate cables to the bottom of the bag, whereby the bag, when deployed, takes the form of a wedge in cross section.

4,691,662

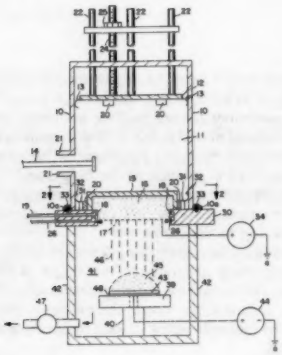
DUAL PLASMA MICROWAVE APPARATUS AND METHOD FOR TREATING A SURFACE

Thaddeus A. Roppel; Jes Asmussen, both of Okemos, and Donnie K. Reinhard, East Lansing, all of Mich., assignors to Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 798,309, Nov. 15, 1985, Pat. No. 4,630,566, which is a division of Ser. No. 641,190, Aug. 16, 1984, Pat. No. 4,585,668, and a continuation-in-part of Ser. No. 849,052, Apr. 7, 1986, which is a continuation-in-part of Ser. No. 641,190, Aug. 16, 1984, Pat. No. 4,585,668. This application Jun. 12, 1986, Ser. No. 873,694

Int. Cl.[4] C23C *14/00*; B05D *3/06*

U.S. Cl. 118—50.1 **17 Claims**



1. An ion generating apparatus for treating a surface which comprises:

(a) a plasma source employing a radio frequency, including UHF or microwave, applicator which is metallic and in the shape of a hollow cavity and which is excited in one or more of its TE or TM modes of resonance and optionally including a static magnetic field surrounding the plasma source which aids in coupling electromagnetic energy to the plasma electrons at electron cyclotron resonance and aids in confining the charged species in the discharge chamber, wherein the plasma is maintained at a reduced pressure and wherein the ion source apparatus includes an electrically insulated chamber having a central longitudinal axis mounted in closely spaced relationship to an area of the applicator defining an opening from the chamber;

(b) a perforated means acting as a grid or screen adjacent the opening which allows ions, free radicals and electrons to be removed from the plasma;

(c) gas supply means for providing a gas which is ionized to form the plasma in the insulated chamber, wherein the radio frequency wave applied to the applicator creates and maintains the plasma in the shape of an elongate plasma disk perpendicular to and surrounding the central longitudinal axis in the chamber;

(d) metal plate means in the cavity mounted perpendicular to the axis;

(e) probe means connected to and extending inside the applicator for coupling electromagnetic energy to the applicator, wherein the plate means and the probe means in the applicator achieves the selected TE or TM mode of resonance of the radio frequency wave in the applicator;

(f) ion attracting means mounted in spaced relationship to the perforated means outside of the chamber for attachment to the surface to be treated for purposes of igniting a hybrid plasma and for attracting ions from the plasma to the surface by bias means providing a suitable voltage potential; and

(g) a platform means supporting the surface to be treated which is electrically insulated by an insulator means from the ion attracting means, wherein the ion attracting means and platform means are spaced from the plasma in the chamber such that the hybrid plasma is formed adjacent to the ion attracting means which is separate from the elongate plasma disk.

4,691,663

DEVELOPING DEVICE

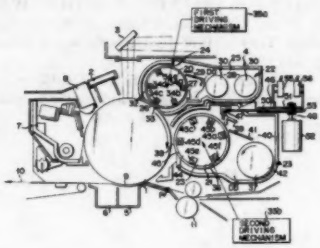
Natsuki Tachibana, Kamakura, and Issey Ichihara, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 758,679, Jul. 25, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 894,747

Claims priority, application Japan, Jul. 31, 1984, 59-160516

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—658 **11 Claims**



1. A developing device, opposing an image carrier which is rotated along one direction, for developing a latent image formed on said image carrier, comprising:

a first developing member, rotatably arranged to oppose said image carrier, for holding a first developing agent thereon, said first developing member comprising a first developing roller having a predetermined diameter;

a second developing member, rotatably arranged to oppose said image carrier and located adjacent to said first developing member along said one direction, for holding a second developing agent thereon, said second developing member comprising a second developing roller having a diameter larger than the predetermined diameter of the first developing roller, said first developing member being located at an upstream side of said second developing member with respect to said one direction;

first driving means for causing said first developing member to rotate in said one direction to supply the first developing agent onto said image carrier;

second driving means for causing said second developing member to rotate in a direction opposite to said one direction to supply the second developing agent onto said image carrier; and

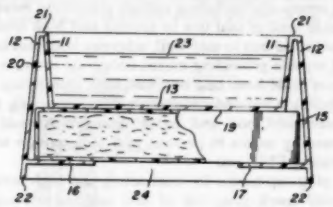
control means for selectively driving any one of said first and second driving means.

4,691,664

PET RECEPTACLE

William H. Crowell, North Wales, Pa., assignor to The Cool Water Corporation, Lansdale, Pa.

Filed Feb. 5, 1986, Ser. No. 826,316
Int. Cl.[4] A01K 7/00
U.S. Cl. 119—61 13 Claims



1. A dish-type pet feeding receptacle equipped with means for cooling potable liquids and maintaining same at reduced temperatures over extended periods which comprises:

(1) a unitary container means consisting essentially of a cavity circumscribed by downwardly divergent inner walls and outer walls which are joined by a rim but otherwise spaced apart from a substantially liquid-free passageway of generally V-shaped cross section, said inner walls terminating in a flat base having a top-side and an underside and said outer walls extending downwardly beyond said inner walls and said base to form a peripheral support; and

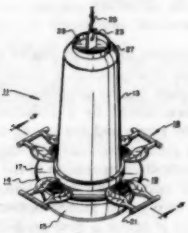
(2) a replacable coolant cartridge resting upon said peripheral support and being in intimate contact with substantially the entire underside of said base.

4,691,665

HUMMINGBIRD FEEDER

Boby R. Hefner, Coleman, Tex., assignor to Hefner Plastics, Inc., Troup, Tex.

Filed Oct. 8, 1985, Ser. No. 785,796
Int. Cl.[4] A01K 39/026
U.S. Cl. 119—77 18 Claims



1. A bird feeder device comprising:

a reservoir having a top end and a lower end with an opening and a side wall between said top end and said lower end, said side wall near said lower end having exterior threads, said lower end opening being at least as large as other interior portions of said reservoir, including the interior portion at the top end,

a bowl assembly having an upper open end with interior threads adapted to matingly engage said threads on said side wall of said reservoir such that said bowl assembly may be removably coupled to said lower end of said reservoir,

said reservoir and said bowl assembly when coupled together being adapted to hold a liquid suitable for feeding birds,

said bowl assembly having an upper wall which extends outwardly from the side wall of said reservoir when said bowl assembly is coupled to the lower end of said reservoir,

said upper wall of said bowl assembly comprising a port for allowing a bird to feed on the liquid in said assembly by way of said port,

support means coupled to said top end of said reservoir to which a suspending means may be coupled for suspending said bird feeder device,

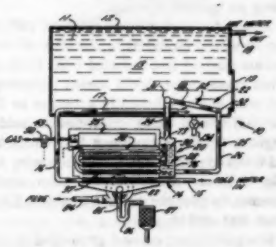
a wall means integral to the top end of said reservoir and surrounding said support means for holding a liquid substance suitable for preventing the passage of ants or the like from the suspending means to the bird feeder device outside of said wall means.

4,691,666

LIQUID HEATER WITH CLOSED LOOP HEAT TRANSFER SYSTEM

Richard M. Scherer, Niles, Mich., assignor to Stratus Corporation, South Bend, Ind.

Continuation-in-part of Ser. No. 605,239, Apr. 30, 1984, Pat. No. 4,660,542. This application Jun. 25, 1986, Ser. No. 878,294
Int. Cl.[4] F22B 1/02
U.S. Cl. 122—33 12 Claims



1. A system for heating liquid and comprising a closed vessel defining a chamber for receiving liquid to be heated, heating element means disposed within said chamber, heat generating means located outside of said chamber, said heating element means forming part of a sealed closed loop circuit within which a working fluid is circulated for transferring heat from said heat generating means to said heating element means, said closed loop circuit including a heating and vaporization zone within which said working fluid is heated by said heat generating means and within which at least a portion of the heated working fluid is converted to vapor, said closed loop circuit further including a condensation zone within said heating element means and within which at least a portion of said vapor is condensed to cause heat to be transferred from said working fluid to said heating element means and to the liquid in said chamber, said heating element means comprising a series of laterally spaced and downwardly inclined tubes located in said chamber between the upper and lower ends of said chamber, a first manifold communicating with the upper ends of said tubes for delivering vapor from said heating and vaporization zone to said tubes, a second manifold communicating with the lower ends of said tubes for returning condensate from said tubes to said heating and vaporization zone, an inlet conduit for admitting a supply of low temperature liquid into the lower end portion of said chamber for upward flow past said heating element means, and an outlet conduit for discharging a supply of heated liquid out of the upper end of said chamber.

4,691,667

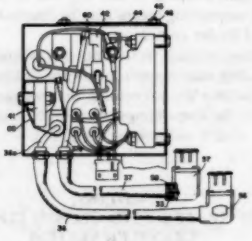
GASOLINE ENGINE EMI SUPPRESSION SYSTEM

H. Alfred Eberhardt, Paoli; Kalman Broitman, Dresher; Richard A. Evangelista, Downingtown; Richard E. Teske, Norristown, and Michael Sulmone, King of Prussia, all of Pa., assignors to Hale Fire Pump Company, Conshohocken, Pa.

Filed Mar. 19, 1986, Ser. No. 841,277

Int. Cl.[4] F02P *11/00*

U.S. Cl. 123—633 **6 Claims**



1. A spark ignition engine device adapted for use with an internal combustion engine driving an accessory such as a pump in an EMI radiation sensitive environment and mounted in a mounting structure, comprising:

an engine having a magneto flywheel supported thereon for generating an ignition current;

first wire means for transmitting ignition current from said magneto flywheel including a plurality of wires carrying said ignition current and radiated EMI from said magneto and a first conductive shield means covering said wires, said first wire means inherently acting as an EMI emitting antenna, said shield being grounded to said support for said magneto flywheel to divert EMI from said magneto and said wires to said ground, said first wire means further including a Lossy Sleeve Cover over said conductive shield means, to prevent radiation of said EMI carried by said wires and said shield;

a control box positioned on and grounded to said mounting structure;

connector means for introducing said first wire means into said control box, including means grounding said first conductive shield to said box to complete transfer of said EMI from said shield to said ground, said connector means connecting said plurality of wires to individual feed-through capacitor means for each wire to transfer said ignition current into said box and said EMI to ground, said ignition current inherently radiating EMI inside said box, said capacitor means being mounted inside and grounded to a wall of said box to disperse EMI transferred by said current flowing through said capacitor means and preventing flow of EMI outside of said box, back along said first wire means to magneto;

power pack means mounted in and grounded to said box to control said ignition current and inherently generating additional EMI inside said box;

second wire means including a plurality of wires connected to transmit ignition current from said individual capacitor means to said power pack means whereby said capacitors prevent re-radiation of said EMI generated by said power pack means back to the outside of said box;

ignition coil means mounted in and grounded to said box for generating high tension ignition current and inherently generating additional EMI;

third wire means including wires connected to transmit ignition current from said power pack means to the input of said ignition coil means, said wires inherently radiating additional EMI;

strap means mounted inside said box to hold said ignition coil means free from vibration to prevent sparking from connections and the resulting generation of EMI during operation of said coils;

resistance type high tension wire leads connected at one end to the output terminal of said ignition coil and psasing through an exit means from said box potentially inherently transmitting EMI out of said box, said exit means including inside grounding means on the inside wall of said box to ground said exit means inside said box to said wall, said exit means also including outside grounding means on the outside wall of said box to ground said high tension wire outside said box to said wall, whereby both said inside and said outside grounding means cooperate to prevent radiation of EMI from said box, said high tension wire further including a braided conductive shield covering said wire outside said box and being mounted to said outside grounding means to prevent said high tension wire from radiating EMI; and

spark plug cap means for connecting said high tension wire to said spark plug cap of said engine, said cap means further including bonding means for preventing arcing generation of EMI and loss of spark due to separation of said lead and said spark plug cap, said bonding means maintaining ground contact between said shield and said cap to provide a ground path for any radiated EMI enclosed by said shield and cap.

4,691,668

ENGINE COOLING SYSTEMS

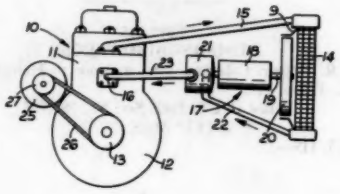
John G. W. West, Pershore, England, assignor to Lucas Electrical Electronics and Systems Limited, Birmingham, England

Filed Jul. 15, 1985, Ser. No. 754,729

Claims priority, application United Kingdom, Aug. 2, 1984, 8419784

Int. Cl.[4] F01P *5/02, 5/10*

U.S. Cl. 123—41.12 **10 Claims**



1. A cooling system for a heat engine including a pump for forced circulation of coolant in a coolant flow circuit of the engine and a cooling fan for assisting in dispersal of heat from the coolant characterised by a common electric pump/fan motor driving the pump and fan in use, and by control means including sensor means responsive to temperature of the coolant in use for controlling operation of the motor automatically as a function of said temperature, wherein said motor is a variable speed, two-speed motor operating at a low speed when the coolant is below a first predetermined temperature and at a high speed when it is above that temperature, said motor further comprising a three brush motor.

4,691,669

ENGINE OVERHEAT PROTECTION SYSTEM

John H. Otteman, 4005 Hecker Pass Hwy., Gilroy, Calif. 95020, and John R. Lufkin, 5534 Brookmead Dr., Whittier, Calif. 90601

Filed Mar. 17, 1986, Ser. No. 840,404

Int. Cl.[4] F01P *11/16, 11/18*

U.S. Cl. 123—41.15 **7 Claims**

1. A coolant system protection system for internal combustion engines comprising;

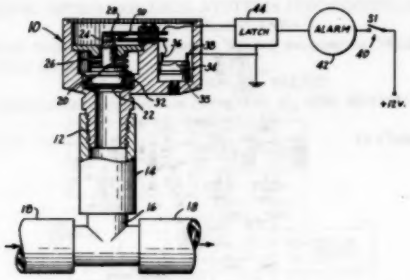
a housing;

a normally closed switch means in said housing;

coolant fluid pressure sensitive means constructed and arranged to operate said normally closed switch means so that said normally closed switch means remains closed at a lower pressure and opens at a higher pressure;

fluid connecting means connecting said coolant fluid pressure sensitive means to detect and respond to coolant fluid pressure;

temperature sensitive switch means mounted in said housing, said temperature sensitive switch means being normally



open at a lower temperature and closed at a higher temperature;

said normally closed switch means and said temperature sensitive switch means being connected in series;

alarm means connected in series with said normally closed switch means and temperature sensitive switch means; and

electrical power supply means connected to said alarm means;

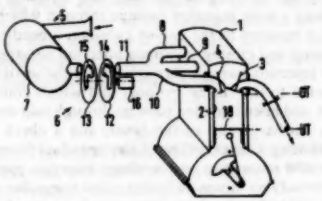
whereby said alarm is activated when fluid pressure is low and temperature is high to indicate coolant loss and higher temperatures concurrently.

4,691,670

INSTALLATION FOR THE CONTROL OF THE CHARGING CYCLE IN INTERNAL COMBUSTION ENGINES

Heinz-Jurgen Bönisch, Groebenzell; Gerhard Brandl; Sybille Noor, both of Munich; Karl-Heinz Oehling, Karlsfeld; Walter Riedl, Munich; Mario Theissen, Munich; Ernst Wodiczka, Munich, and Alwin Macht, Mainleus, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 664,777, Oct. 25, 1984, abandoned.
This application Jun. 16, 1986, Ser. No. 874,871
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338870
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—52 MF **26 Claims**



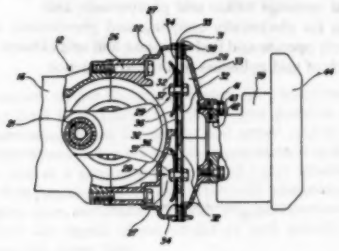
1. An installation for controlling the charge-exchange in internal combustion engines, comprising main control means for controlling the timing of a total inlet charge to the internal combustion engine and auxiliary control means coordinated to the main control means, whereby the auxiliary control periods are variable, said auxiliary control means being operatively connected on the engine suction side upstream of the main control means to also control the timing of the total inlet charge by overriding the timing called for by the main control means and opening in the end phase of the opening period of the main control means, and the opening beginning of the auxiliary control means, with increasing engine rotational speeds increasingly approaching the opening beginning of the main control means.

4,691,671

CARBURETOR ICING PREVENTING DEVICE

Seiichi Nishimura, Hamamatsu, Japan, assignor to Sanshin Kogy Kabushiki Kaisha, Japan

Filed Mar. 18, 1986, Ser. No. 840,780
Claims priority, application Japan, Mar. 22, 1985, 60-55949
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 V **6 Claims**



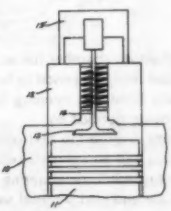
1. An internal combustion engine having a body defining in part a variable volume chamber in which combustion occurs, an induction passage in said body for delivering a charge to said combustion chamber, an intake manifold affixed to said body and constructed from a highly conductive material and defining a passage communicating with said body induction passage, a highly heat conductive gasket sealingly engaged between said body and said intake manifold for promoting heat transfer therebetween, and a charge forming device affixed to said intake manifold for delivering a fuel/air charge to said passage.

4,691,672

CYBERNETIC ENGINE

Horace L. Jones, 9613 Woodstream Dr., Richmond, Va. 23233

Filed Dec. 20, 1985, Ser. No. 811,916
Int. Cl.[4] F01L *9/04*
U.S. Cl. 123—90.11 **6 Claims**



1. A timing mechanism adapted for use in conjunction with a four stroke internal combustion engine including a plurality of pistons disposed to reciprocate within cylinders and attached to a crankshaft in a timed sequence, each of said cylin-

ders including a fuel-air intake and an exhaust valve; said timing mechanism comprising:

a timing disc rotatably attached to said engine and operably attached to and rotated by said crankshaft, said timing disc including:

a number of sets of firing order openings formed therethrough, each of said sets of firing order openings being spaced radially outward from the axis of rotation of said timing disc; and

a number of sets of return openings formed through said timing disc 180° outward from a corresponding set of firing order openings;

a light source attached to said engine and disposed in closely spaced relationship to one side of said timing disc such that the light source emits light through said openings each time the openings are rotated into alignment with said light source;

a photosensor attached to said engine and disposed in closely spaced relationship to the other side of said timing disc opposite said light source such that light emitted through said openings strikes said photosensor; and

means for electrically coupling said photosensor to selectively operate said fuel-air intake and said exhaust valve of each of said cylinders in a timed sequence.

4,691,673

CERAMIC AUXILIARY COMBUSTION CHAMBER

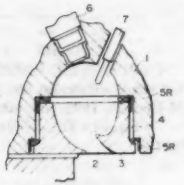
Takio Kojima, and Masato Taniguchi, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Apr. 7, 1986, Ser. No. 848,975

Claims priority, application Japan, Apr. 8, 1985, 60-51134

Int. Cl.[4] F02B *3/00*

U.S. Cl. 123—271 **16 Claims**



1. An auxiliary combustion chamber for an internal combustion engine, the chamber being disposed to be mounted within an opening in a cylinder head, the opening having an internal surface, the chamber being defined by:

a ceramic nozzle body disposed in said opening, said nozzle body having an axis and an external surface dimensioned to fit in said opening while maintaining a space between said external surface and said internal surface; and

a one piece annular gasket integrally fit on said external surface to seal said space between said internal surface and said external surface, said gasket having a first portion extending parallel to said nozzle body axis and gripping said external surface of said nozzle body and a second portion extending perpendicular to said nozzle body axis.

4,691,674

MULTISTAGE FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

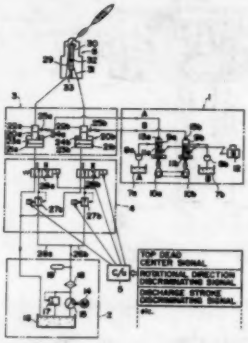
Shojiro Otsuka, and Hideaki Komada, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,918

Claims priority, application Japan, Oct. 13, 1984, 59-215021; Oct. 15, 1984, 59-215839

Int. Cl.[4] F02M *43/00*

U.S. Cl. 123—299 **9 Claims**



1. A multistage fuel injection system for an internal combustion engine, said system comprising:

(a) flow control means for feeding a controlled quantity of main fuel and a controlled quantity of auxiliary fuel independently from one another;

(b) pressure generating means for generating a working pressure;

(c) intensifying means operatively connected to said flow control means for receiving the main and auxiliary fuels therefrom and operatively connected to said pressure generating means for intensifying the pressure of the main and auxiliary fuels received from said flow control means through the agency of said working pressure generated by said pressure generating means;

(d) selector means interposed between said pressure generating means and said intensifying means for selectively connecting and disconnecting said pressure generating means and said intensifying means;

(e) control means operatively connected to said selector means and responsive to operating conditions of the engine for controlling the operation of said selector means; and

(f) an injection nozzle connected to said intensifying means for injecting the main fuel and the auxiliary fuel respectively into the engine cylinder, said injection nozzle including a main injection passage through which the main fuel is injected to the engine cylinder, a needle valve for opening and closing said main injection passage, an auxiliary injection passage through which the auxiliary fuel is injected to the engine cylinder and which communicates with said main injection passage through said needle valve at a discharge end of the latter, and a check valve for preventing a reverse flow of the main fuel from said main injection passage to said auxiliary injection passage, and

said intensifying means including a first intensifier connected to said main injection passage and a second intensifier connected to said auxiliary injection passage, said flow control means including a first flow control pump connected to said first intensifier for feeding the main fuel thereto and a second flow control pump connected to said second intensifier for feeding the auxiliary fuel thereto,

said selector means including a first directional control valve

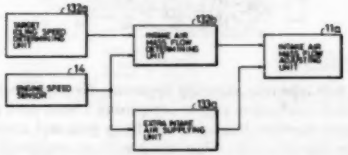
connected to said first intensifier and said pressure generating means and controlled by said control means to selectively interconnect said first intensifier and said pressure generating means, and a second directional control valve connected to said second intensifier and said pressure generating means and controlled by said control means to selectively interconnect said second intensifier and said pressure generating means.

4,691,675

IDLING SPEED CONTROL SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Masato Iwaki, Higashihiroshima, Japan, assignor to Mazda Motor Corp., Japan

Filed Jul. 7, 1986, Ser. No. 882,722
Claims priority, application Japan, Jul. 11, 1985, 60-153462
Int. Cl.[4] F02D *41/16*
U.S. Cl. 123—339 **14 Claims**



1. An idling speed control system for an internal combustion engine comprising;

engine speed sensing means for detecting speed of the engine,

target idling speed determining means for setting a target idling speed,

intake air mass flow determining means for obtaining a difference between an actual idling speed of the engine detected by said engine speed sensing means and said target idling speed set by said target idling speed determining means and producing a control signal for determining intake air mass flow supplied to a combustion chamber of the engine on the strength of the difference obtained,

intake air mass flow adjusting means for adjusting intake air mass flow supplied actually to the combustion chamber of the engine in response to said control signal, and

extra intake air supplying means for causing said intake air mass flow adjusting means to start supplying the combustion chamber of the engine with extra intake air mass flow determined apart from the intake air mass flow determined in response to said control signal when the actual idling speed of the engine has gone down to be lower than a first predetermined speed and then to cause said intake air mass flow adjusting means to cease supplying the combustion chamber of the engine with the extra intake air mass flow when the actual idling speed of the engine has risen to attain a second predetermined speed higher than said first predetermined speed.

4,691,676

APPARATUS FOR THROTTLE VALVE CONTROL

Kazuhiro Kikuchi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 10, 1986, Ser. No. 837,845
Claims priority, application Japan, Mar. 12, 1985, 60-48792
Int. Cl.[4] F02D *41/10, 41/12*
U.S. Cl. 123—399 **7 Claims**

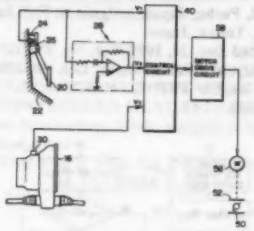
1. An apparatus for use with an internal combustion engine having an accelerator, a throttle valve situated within an induction passage, and a transmission, comprising:

a first signal source for generating an electrical signal indicative of the position of said accelerator;

a second signal source for generating an electrical signal indicative of the gear position of said transmission;

a control circuit operable to determine a demand value corresponding to a setting of the position of said throttle valve in response to said accelerator position indicative signal;

a throttle actuator connected to said control circuit for moving said throttle valve to said determined setting; and



said control circuit including means for determining an upper limit in accordance with the gear position of said transmission, means for setting said upper limit at a first predetermined value when said transmission is in a lower gear and at a second predetermined value smaller than said first predetermined value when said transmission is in a higher gear, and means for modifying said demand value to limit the speed of movement of said throttle valve below said upper limit.

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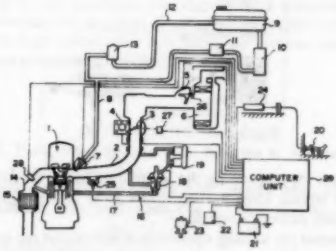
THROTTLE VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Makoto Hotate; Toshio Nishikawa; Kobuo Takeuchi; Itaru Okuno, and Tadataka Nakazumi, all of Hiroshima, Japan, assignors to Mazda Motor Corp., Japan

Filed Jan. 21, 1986, Ser. No. 820,613
Claims priority, application Japan, Jan. 24, 1985, 60-12007
Int. Cl.[4] F02D *41/10, 41/12*
U.S. Cl. 123—399 **10 Claims**



1. A throttle valve control system for an internal combustion engine comprising an accelerator position sensor for detecting the position of the accelerator, a throttle valve opening determining means which receives the output of the accelerator position sensor and determines the opening of the throttle valve, and a throttle valve driving means which drives the throttle valve to the position corresponding to the opening determined by the throttle valve opening determining means, wherein the improvement comprises that the throttle valve opening determining means includes means for determining the opening of the throttle valve in response to the position of the

accelerator detected by the accelerator positon sensor such that the change in the opening of the throttle valve for a given change in the position of the accelerator is relatively small when the position of the accelerator is within a predetermined range and is relatively large when the position of the accelerator is both above and below the predetermined range.

4,691,678

SYSTEM FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

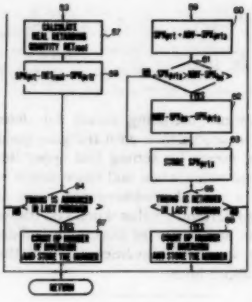
Masaaki Nagai, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

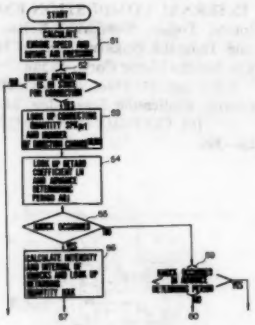
Filed Dec. 24, 1985, Ser. No. 813,107

Claims priority, application Japan, Dec. 28, 1984, 59-280553

Int. Cl.[4] F02P 5/14; F02D 41/22

U.S. Cl. 123—425 **2 Claims**





1. A system for controlling the ignition timing of an internal combustion engine having a microprocessor and an ignition timing control device comprising:

sensing means for sensing operating conditions of the engine and for producing an engine operating condition signal;

a knock sensor for sensing engine knocking and for producing a knock signal;

first means responsive to the engine operating condition signal and knock signal for producing an ignition timing correcting signal representing an ignition timing correcting quantity at a time for deciding the ignition timing;

second means for counting up the number of inversions of correcting direction dependent on the ignition timing correction signal;

third means for reducing the ignition timing correcting quantity as the number increases.

4,691,679

FUEL INJECTION PUMPING APPARATUS

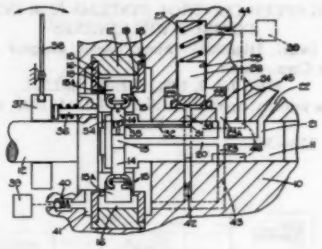
David F. Lakin, London, England, assignor to Lucas Limited public limited company, Birmingham, England

Filed Jul. 10, 1985, Ser. No. 753,548

Claims priority, application United Kingdom, Jul. 13, 1984, 8417860

Int. Cl.[4] F02M 41/14

U.S. Cl. 123—450 **5 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a body part, a rotary distributor member housed in the body part and arranged in use to be driven in time relationship with an associated engine, a pumping plunger housed within a bore in the distributor member, a cam ring for imparting inward movement to the plunger to displace fuel from the bore, a delivery passage in the distributor member for registration with an outlet port in the body part during successive inward pumping strokes of the pumping plunger, means for supplying fuel to the bore during a filling stroke of the plunger, a piston slidable within a cylinder, resilient means biasing the piston into contact with an end wall at one end of the cylinder, said one end of the cylinder being enlarged to define a chamber communicating with said bore during the pumping stroke of the plunger, a recess defined between said piston and said end wall when the piston is in contact with said end wall, a passage opening onto said end wall to communicate with said recess, and which is closed off from said chamber when the pistion is in contact with said end wall, a restrictor through which said passage communicates with a low pressure source, valve means formed by said plunger for connecting said passage intermediate said restrictor and said recess with said bore during the inward movement of the plunger, said plunger being adjustable whereby the instant during the inward movement of the plunger at which the passage is connected with the recess can be varied, the arrangement being such that when during inward movement of the pumping plunger, said passage is connected to the bore, the pressure in said recess will be increased to allow movement of the piston away from said end wall, the piston moving outwardly in the cylinder thereby reducing the pressure in the bore and terminating the flow of fuel through said outlet.

4,691,680

STARTING-ENRICHMENT CONTROL FOR A FUEL-INJECTED ENGINE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 22, 1986, Ser. No. 865,852

Int. Cl.[4] F02D 41/06

U.S. Cl. 123—491 **10 Claims**

1. In a multi-cylinder internal-combustion engine having a starter-operated fuel pump and an electronically controlled fuel-injection system wherein a pulse generator provides fuel-injection control pulses of time duration proportioned to desired throttle setting among other factors, the pulses each having a duration which is at all times a small fraction of the duration of a full cycle of operation of a given cylinder of the

engine, and wherein engine-cranking starter-operated means are operative upon starting the engine to temporarily enrich the fuel supplied to the engine by temporarily providing fuel-injection control pulses of greater time duration than that which applies for maximum throttle setting, the improvement in which the starter-operated means includes: (1) pressure-sensitive means which is responsive to pumped fuel pressure to delay generation of any greater-duration pulses until sensed achievement of a predetermined adequate level of fuel-injection pressure, whereby engine-priming is initiated only with adequate fuel pressure, (2) means limiting engine-priming to a

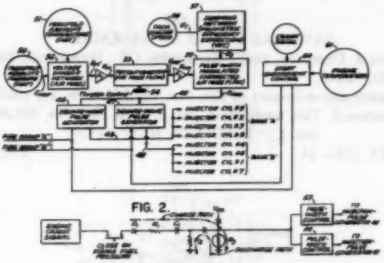


FIG. 2

single priming pulse of relatively great duration for each cylinder for any given continuous period of engine cranking, (3) temperature-sensitive means which is responsive to engine temperature to determine the duration of said single priming pulse as an inverse function of sensed engine temperature, and (4) time-delay means responsive to an engine-priming operation of said pressure-sensitive means to determine a further delay period in which the generation of any greater-duration pulse is materially suppressed, whereby the danger of engine-flooding is avoided or substantially reduced for attempted starting within said further delay period.

4,691,681

ARRANGEMENT FOR CONTROLLING THE INTAKE AIR FOR THE CARBURETOR OF A HAND-HELD PORTABLE TOOL

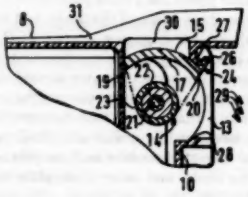
Klaus Höppner, Marbach, and Bernhard Kiefel, Schorndorf-Schornbach, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 26, 1986, Ser. No. 878,622

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523949

Int. Cl.[4] F02M *31/14*

U.S. Cl. 123—556 **27 Claims**



1. Arrangement for controlling the intake air for a carburetor of a hand-held portable tool such as a chain saw or the like which is suitable for both cold weather and hot weather operation, the portable tool also including a housing and an engine having a cylinder mounted in the housing, the arrangement comprising:

pass-through passage means for passing heated cooling air from the cylinder across a gap in the housing to adjacent the inlet of the carburetor air cleaner during cold weather operation;

a slide pivotally mounted in said housing and means for selectively moving the same about a pivot axis between a first position whereat said pass-through passage means is closed during hot-weather operation and a second position whereat said pass-through passage means is open so as to permit passage of said heated cooling air therethrough during said cold weather operation; and,

said slide being configured as a deflecting member for baffling said heated cooling air and then guiding the same in the direction toward said carburetor.

4,691,682

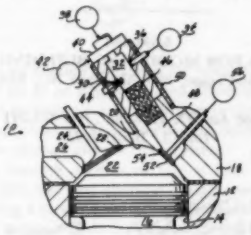
METHOD AND APPARATUS FOR MAXIMIZING INTERNAL COMBUSTION ENGINE WORK OUTPUT BY CONTROLLED HEAT RELEASE

Lyle O. Hoppie, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 3, 1986, Ser. No. 825,281

Int. Cl.[4] F02M *31/04*

U.S. Cl. 123—558 **11 Claims**



1. An improved expansible chamber heat engine of the type having cyclical compression and expansion of fluid introduced into a chamber during each engine cycle, said compression and expansion of said fluid caused by cyclical movement of a movable element defining in part said chamber, said movable element reaching a position during each engine cycle corresponding to minimum chamber volume to cause said compression of said fluid therein and means for causing an addition of heat to said fluid during each engine cycle while said fluid is compressed in said chamber, the improvement comprising means for initiating the addition of said heat at a point substantially later in said cycle after said movable element reaches said position of minimum chamber volume.

4,691,683

BOW STRING RELEASE

Paul L. Peck, Fond du Lac, Wis., assignor to Archery Designs, Inc., Fond du Lac, Wis.

Continuation-in-part of Ser. No. 716,627, Mar. 27, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 906,564

Int. Cl.[4] F41C *19/00*

U.S. Cl. 124—35 A **10 Claims**

1. A bow string release comprising,

a body having a string receiving notch in one end of said body and a hole through the other end of said body,

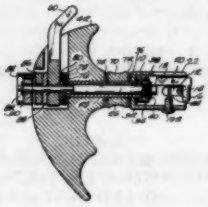
a sear pivoted in the body adjacent said notch and having string retaining means operative to retain a bow string in said notch when said sear is in its operative position,

a guide sleeve mounted in said hole and projecting from said body away from said notch, said sleeve having an enlarged head inside said body larger than said hole to couple said sleeve and said body for unlimited relative rotation and to prevent axial separation of said sleeve from said body,

a pull pin slidably mounted in said body and said sleeve for

movement between a first position and a retracted position, said pin engaging said sear in said first position to retain said sear in said operative position and releasing said sear upon movement to said retracted position,

spring means biasing said pin to said first position,



handle means rotatably mounted on and coupled to said sleeve to prevent axial separation of said handle means and said sleeve,

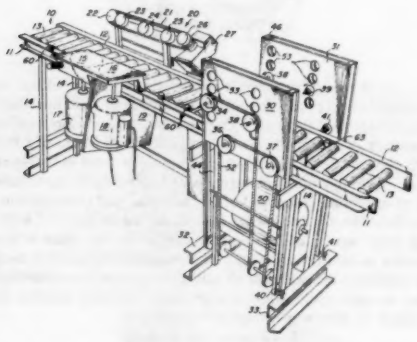
trigger means engaging said handle means and said pin and operative to pull said pin to said retracted position.

4,691,684

APPARATUS FOR MODIFYING BUILDING BLOCKS

Jorge L. Negron-Crespo, 809 Managua St., San Juan, P.R. 00921

Filed Jan. 13, 1986, Ser. No. 818,041
Int. Cl.[4] B28D *1/18*
U.S. Cl. 125—3 **8 Claims**



1. Apparatus for modifying building blocks which vary somewhat in size to provide spaced-apart depressions in the top and bottom surfaces thereof with the bottoms of the depression in the bottom surface being at a uniform distance from the top surface of the blocks comprising:

A. roller means for supporting the blocks as they are moved, the blocks being supported on one side thereof so that the top and bottom surfaces of the blocks are vertically positioned as said blocks are moved through the apparatus;

B. means to advance said blocks through the apparatus while on said rollers;

C. oppositely juxtaposed drill-carrying vertically disposed plates movable toward and away from one another at opposite sides of said roller support means, said drill-carrying vertical plates being pivotally supported and means are provided at the upper ends of said plates for moving said plates toward and away from one another;

D. a plurality of laterally spaced apart oppositely directed drills fixedly mounted on said plates for movement therewith, said drills carrying horizontal drill bits for drilling depressions in the top and bottom surfaces of said blocks;

E. stop means for stopping the advancing blocks when they are properly positioned with respect to said drills;

F. means for horizontally fixing the top of said block between said plates;

G. means for moving said plates toward one another so that said drill bits will drill depressions in the tops and bottoms of said blocks;

H. means for moving said plates apart after said depressions have been drilled; and

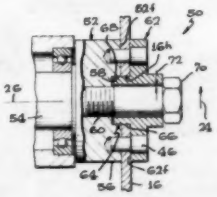
I. means to remove the drilled block from the apparatus after said plates have been moved apart.

4,691,685

SAWBLADE COLLAR ASSEMBLY

Edward J. Dempsey, 16482 Barnstable Cir., Huntington Beach, Calif. 92649

Continuation-in-part of Ser. No. 705,982, Feb. 27, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 881,637
Int. Cl.[4] B28D *1/04*; B23P *19/00*
U.S. Cl. 125—14 **2 Claims**



1. A concrete cutting saw which can move along a concrete surface while cutting a slot in the surface, comprising:

a driver which has means which supports it in movement along predetermined opposite forward and rearward drive directions along a surface and which weighs a plurality of hundreds of pounds so it cannot be easily moved sidewardly in a horizontal direction perpendicular to said drive direction, said driver having a motor device with an output shaft that can rotate about a shaft axis perpendicular to said drive direction and which has a largely flat face for abutting a face of a circular sawblade;

a circular diamond sawblade having a central hole, said blade having one face abutting said flat shaft face;

an outer blade plate which abuts a second face of said blade;

said shaft end has a fastener-receiving hole of smaller diameter than said blade hole lying on said axis, and has a recess which is shallower than said fastener-receiving hole and of no greater diameter than said blade hole and centered on said shaft axis;

said outer blade plates has a main plate portion with a largely flat face that abuts a face of the blade, and has a projecting collar with a blade-engaging portion of the same size as the blade hole and lying therewithin and a recess-engaging portion of the same diameter as said shaft recess and lying there, with a clearance between the collar and blade hole no more than about two-thousandths inch and a clearance between the collar and shaft recess no more than about two-thousandths inch to precisely center the shaft on the blade, said outer blade plate having a central hole; and

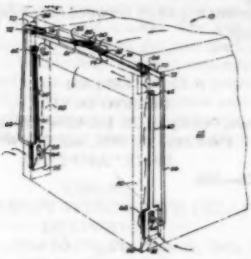
a fastener extending through said central hole in said outer blade plate and said fastener-receiving hole in said shaft to fasten said outer blade plate to said shaft, the clearance between the fastener and the central hole being greater than the clearance between the blade and the blade-engaging portion of the collar, whereby to enable precision blade mounting and to enable the driver to move parallel to said drive direction while a detached stuck blade remains stuck in place.

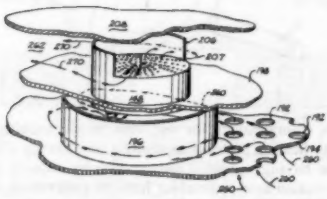
4,691,686

GASEOUS FLOW CONTROL FOR COMBUSTION DEVICES

Bernard V. Alvarez, Rt. 1, Box 249, Candler, N.C. 28715

Filed Oct. 7, 1985, Ser. No. 785,151
Int. Cl.[4] F24C 1/14
U.S. Cl. 126—77 **26 Claims**





1. An apparatus for burning fuel to provide heat, comprising:
a housing defining a firebox within said housing for said burning;
at least one intake air pathway joining the exterior of said housing with said firebox;
at least one exhaust pathway joining said firebox with the exterior of said housing;
a controllable member associated with said intake pathway and controllably movable for alternately closing and opening such pathway; and
control means, operatively associated with said controllable member, for controlling the air flow within said intake pathway in response to a first temperature condition of said burning within said housing, and for closing said intake pathway in response to a second condition of excess of pressure within said housing.

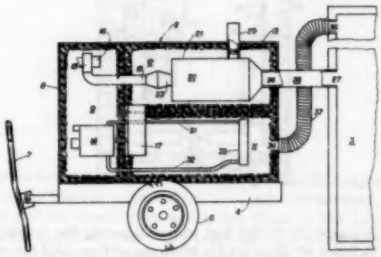
22. A stove having a combustor, comprising:
a firebox for burning fuel to produce heat and combustion gasses;
an intake air pathway for providing primary air flow to said firebox and secondary air flow to said combustor; and
means associated with said combustor for providing a balanced flow of a mixture of said combustion gasses and said secondary air flow across the surface of said combustor; wherein
said stove further comprises an exhaust pathway connectable with a chimney associated therewith; and wherein
said means comprises:
a lower chamber, receiving in one portion thereof said secondary air flow from said intake pathway and a flow of combustion gasses form said firebox region, and
an upper chamber adjacent said lower chamber, and which connects with said exhaust pathway; and wherein
said combustor is lodged in an opening defined by a mutual wall of said lower and upper chambers such that said combustor partly resides in each of said chambers, and said combustor completely fills such opening so that combustion gases and secondary air flow throughout the entirety of said combustor from said lower chamber to said upper chamber.

4,691,687

PORTABLE AIR HEATING APPARATUS

Paul A. Mutchler, University City, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.

Filed Sep. 2, 1986, Ser. No. 902,493
Int. Cl.[4] F24H 3/06
U.S. Cl. 126—104 A **8 Claims**



1. Portable air heating apparatus for supplying and recirculating heated air to an equipment and personnel housing plenum chamber including a heated air inlet in the lower portion of the plenum chamber and a return air outlet in the upper portion of the plenum chamber comprising:
a portable housing partitioned into at least two chambers with at least one said chambers being sound-conditioned and having a power means disposed therein;
air heating means including a combustor and heat exchanger disposed in said housing outside said chamber containing said power means, said air heating means communicating with a hot air outlet in said housing through which heated air can be supplied through an adjustable duct to a heated air inlet in the lower portion of said plenum chamber to be heated;
blower means disposed in said housing, said blower means being connected to said power means to deliver air to said air heating means; and
radiator means disposed in said housing outside said chamber containing said power means, said radiator means being connected to said power means to circulate coolant fluid therethrough from and to said power means to control the temperature of said power means, said radiator means being adjacent to and directly communicating with a return air inlet in said housing which can be connected through an adjustable duct to a return air outlet in the upper portion of said plenum to heat return air therefrom before it is recirculated to said air heating means through said blower means.

4,691,688

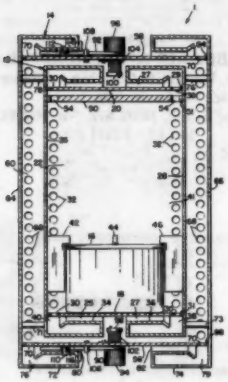
SAFETY HEATER

Charles L. Urso, 215 Newton St., Waltham, Mass. 02154

Continuation-in-part of Ser. No. 717,310, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 644,987, Aug. 28, 1984, abandoned, and Ser. No. 642,059, Aug. 20, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 919,086
Int. Cl.[4] A61F 7/08
U.S. Cl. 126—208 **23 Claims**

1. A portable safety heater comprising:
a container having at least one wall and two open ends;
a fuel source;
at least two end caps substantially enclosing the open ends of the container wherein the combination encloses the fuel

source, the end caps having entrapment means which operate in all positions of the heater for entrapping fuel



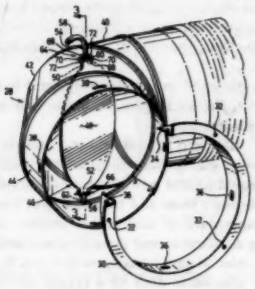
displaced from the fuel source wherein the combination includes air passages for allowing airflow past the entrapment means to support combustion of fuel therein.

4,691,689

ONE-PIECE ADJUSTABLE DAMPER

Charles G. Shepherd, Oakville, and Samuel Travale, Stoney Creek, both of Canada, assignors to B. D. Wait Co. Limited, Oakville, Canada

Filed Dec. 5, 1986, Ser. No. 938,479
Claims priority, application Canada, Dec. 6, 1985, 497016
Int. Cl.[4] F23L *3/00*
U.S. Cl. 126—295 **2 Claims**



1. A adjustable damper for positioning in an air duct to adjustably restrict flow of air through the duct, the damper comprising:

a tubular duct section defining first and second diametrically opposed openings;

first and second sets of detents formed from the material of the duct and extending radially about the respective openings to define a plurality of damper settings, the first detent set being offset angularly relative to the second detent set; and

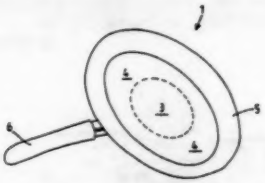
a valve element having a circular central portion proportioned to fit within the duct section, diametrically opposed first and second shoulders projecting from the periphery of the disc, aligned first and second stub axles formed from the material of the disc and dependent from the respective first and second shoulders, the shoulders being engageable with the respective first and second sets of detents such that in any one selected angular position of the valve element, the element is located by engagement of one of the shoulders in one of the detents of the detent sets, and means attached to one of the stub axles to permit manual operation to change the angular position of the element in the duct section to position one of the shoulders in another of the detents of the detent sets whereby the flow of air through the duct can be controlled in stages by moving the element angularly between fully closed and fully open positions.

4,691,690

FRYING DEVICE

Erling Jensen, Nordlyvej 26, DK-8550 Ryomgaard, Denmark

Filed Sep. 15, 1986, Ser. No. 907,721
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—390 **2 Claims**



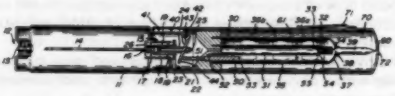
1. A frying device for use with an electrically heated hot circular heating plate, comprising a pan having a bottom, said bottom having a central planar circular massive hot heating plate contact area protruding from its underneath exterior and providing a high heat transfer central contact area, said bottom also having a wing-shaped bottom portion on each side of said contact area with a portion bordering a side of said hot plate contact area having a periphery of a length which is from 30 to 80% of its total periphery and providing a good heat transfer from said hot heating plate contact area, said bottom having a transition zone between said hot heating plate contact area and said wing-shaped bottom portion which has a thickness greater than the smaller thickness of said wing-shaped bottom portions, said hot heating plate contact area having a thickness which is from 20 to 50% greater than the smallest thickness of said wing-shaped bottom portion.

4,691,691

GAS POWERED SOLDERING IRON

Jean-Pierre Patenaude, 104 Guigues Street, Ottawa, Ontario, K1N 5H7, Canada

Filed Jul. 24, 1985, Ser. No. 758,605
Claims priority, application Canada, Jun. 26, 1985, 485355
Int. Cl.[4] B23K *3/02*
U.S. Cl. 126—414 **11 Claims**



1. A gas powered, pencil-shaped, soldering iron suitable for positioning in a pocket of an article of clothing comprising a reservoir for liquid fuel, a housing attached to said reservoir including a control valve device adapted to regulate fuel flow from the reservoir, said control valve device having vaporizing means and a nozzle to conduct a regulated amount of pressurized fuel to an input side of a venturi adapted to vaporize and mix said fuel with air to produce a fuel-air mixture, a

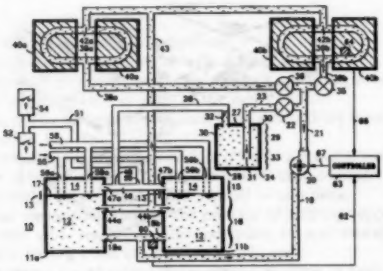
transfer tube secured to an output side of said venturi, a stainless steel combustor adapted to maintain combustion in the presence of said fuel-air mixture and secured at a combustor end of the transfer tube remote from said venturi, an "on-off" switch adapted to activate fuel flow through said nozzle of said control valve device whereby to initiate and terminate fuel flow from said reservoir to said venturi, a spark generating means simultaneously activated by switching on said switch to initiate an ignition spark in said combustor end, spark electrode means connected to both said transfer tube and an outside shield, respectively, to form a spark gap said spark generating means producing a high voltage which is transmitted by said transfer tube to said spark electrode, which is positioned adjacent said combustor, and a soldering element positioned forwardly of said combustor so as to be heated by said combustor when burning in the presence of said fuel-air mixture.

4,691,692

SOLAR ENERGY SYSTEM WITH DELAYED DRAIN-BACK

Leo B. Conner, Jr., 2444 N. 39th Pl., Phoenix, Ariz. 85018, and John M. Conner, 1458 N. Ashland, Mesa, Ariz. 85203

Filed Dec. 5, 1985, Ser. No. 804,828
Int. Cl.[4] F24J *2/40*
U.S. Cl. 126—422 **17 Claims**



1. A solar energy system comprising:

a storage tank having upper and lower sections, said tank lower section being for holding a heat transferring liquid and said tank upper section being for holding a gas;

a solar collector located above said storage tank and having a collector feed and a collector return wherein a first one of the collector feed and return couples to the lower section of said storage tank;

a pump coupled to the lower section of said storage tank and to a second one of the collector feed and return, said pump exhibiting an active state in which the pump moves a portion of the liquid into said solar collector and exhibiting an inactive state; and

means for preventing a portion of the gas from substantially replacing the liquid in said collector until a predetermined amount of time passes after said pump initially exhibits the inactive state, said preventing means being located above said storage tank and said preventing means having a drainback feed coupled to said solar collector and a drainback return coupled to the upper section of said storage tank.

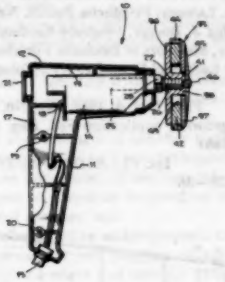
4,691,693

MASSAGE DEVICE

Ray S. Sato, Carson, Calif., assignor to Magnetic Massage Company, Los Angeles, Calif.

Filed Sep. 2, 1986, Ser. No. 902,462
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—24.1 **13 Claims**

1. A massage device for the human body comprising a jacket having a handgrip and a chamber in said jaceket having an electric heater, said heater comprising a heat absorbent core and a shaft on said core having an exposed heat delivering end, an applicator assembly for engagement with the body of the user and a connection between the applicator and the shaft,



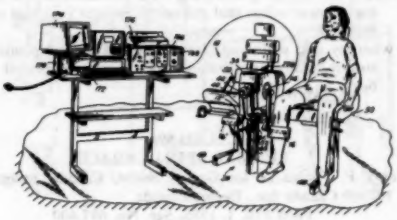
said applicator assembly comprising a permanent magnet, a heat transfer plate on a rear side of the applicator between said magnet and the connection, and a face plate on the forward side of the applicator, said face plate having a finish plate—constituting a body-engaging exterior surface.

4,691,694

MUSCLE EXERCISE AND REHABILITATION APPARATUS

Robert L. Boyd, Woodcliff Lake; Richard Krukowski, Chatham, both of N.J., and Daniel Y. Gezari, Chevy Chase, Md., assignors to Biodex Corporation, Shirley, N.Y.

Continuation-in-part of Ser. No. 676,493, Nov. 29, 1984, Pat. No. 4,628,910. This application Sep. 15, 1986, Ser. No. 907,392
The portion of the term of this patent subsequent to Feb. 16, 2003, has been disclaimed.
Int. Cl.[4] A63B *23/00*
U.S. Cl. 128—25 R **56 Claims**



1. A muscle exercise and rehabilitation apparatus comprising:

movable fixture means against which a force can be applied;

servo motor means coupled tc the fixture means;

sensing means for sensing the force applied to the fixture means and for producing a load signal corresponding thereto;

speed detecting means for producing a velocity signal corresponding to the speed of the fixture means;

closed loop servo means for controlling said motor means in response to said load signal and said velocity signal to regulate the velocity of said fixture means;

limit means for preventing movement of said fixture means past at least one set limit;

storage means for storing a limit signal corresponding to each said limit; and

limit setting means for enabling said storage means to store

the respective limit upon movement of said fixture means to each said limit.

4,691,695

APPARATUS FOR MEDICAL TREATMENTS

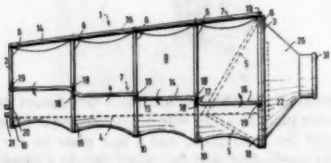
Josef Birk, Lohmar; Friedhelm Baisch, Neunkirchen-Seelscheld, and Heinz J. Borger, Siegburg-Kaldauen, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfart e.V., Cologne, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,534

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437461

Int. Cl.[4] A61H *1/00, 33/06*

U.S. Cl. 128—38 **16 Claims**



1. In an apparatus for medical treatments, examinations or tests having a chamber configured to be connected to a vacuum source and including at one end thereof a passage aperture having a flexible sealing member, an improved chamber support structure adapted to be dismantled comprising:

a foldable bellow;

at least three substantially parallel peripheral members disposed to support the bellow, said peripheral members being capable of relative movement with respect to each other,

a longitudinal stiffening element secured to a first one of the peripheral members by a hinge, said hinge enabling rotation of said longitudinal stiffening element from a first position substantially parallel to said first peripheral member to a second position substantially perpendicular to said first peripheral member,

means for engaging said peripheral members to said stiffening element when said stiffening element is in said second position,

whereby said stiffening element in said second position restrains relative movement among said peripheral members.

4,691,696

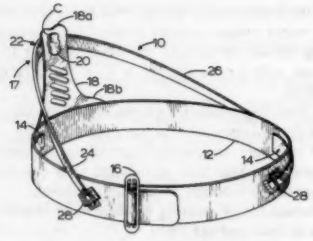
LUMBAR SPINAL BRACE

Henry F. Farfan de los Godos, Beebe, Canada, assignor to 102160 Canada Inc., Beebe, Canada

Filed Feb. 1, 1985, Ser. No. 697,400

Int. Cl.[4] A61F *5/02*

U.S. Cl. 128—78 **31 Claims**



1. A lumbar spinal brace comprising:

a belt adaptable to be wrapped into a generally round shape having left and right hand halves and a central axis dividing said halves;

a first bracing means extending from the belt;

a contact point defined by the first bracing means, said contact point being disposed upwardly and laterally from the central axis, the first bracing means being resistant to rearward movement of the contact point; and,

said first bracing means comprising a support member extending from the belt and having an upper portion defining the contact point, and, a movement limiting means connected to the support member and the belt for resisting rearward movement of the contact point.

4,691,697

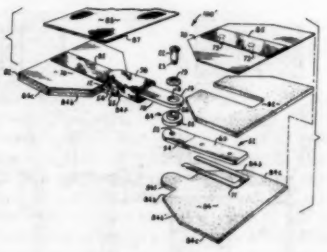
KNEE SUPPORT

Stephen C. Arensdorf; Lawrence T. Stromgren, both of Hays, Kans., and Noel Goudreau, Bourbonnais, Ill., assignors to Strom-Tec, Inc., Hays, Kans.

Filed Apr. 5, 1985, Ser. No. 720,169

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 L **3 Claims**



1. A knee support for attachment to a leg of the user to protect the knee, said support comprising:

a rigid impact bar having upper and lower ends;

an upper mounting bar adapted to lie adjacent said leg above the knee;

a lower mounting bar adapted to lie adjacent said leg below the knee;

means pivotally connecting said upper end of the impact bar to said upper mounting bar, and pivotally connecting said lower end of the impact bar to said lower mounting

upper pressure plate means on said upper mounting bar adapted to be secured to the user's leg above the knee;

lower pressure plate means on said lower mounting bar adapted to be secured to the user's leg below the knee, whereby said impact bar may be positioned in laterally spaced, spanning relationship to the knee;

shock-absorbing, anti-friction means between said upper and lower ends of the impact bar and the respective upper and lower mounting bars, comprising upper and lower bushing members interposed between said ends of the impact bar and the respective mounting bars at said pivotal connections;

a ridge on said upper bushing member projecting therefrom and engageable with a front edge of said impact bar and said upper mounting bar upon movement thereof to a position selected to prevent further movement and hyperextension of the knee; and

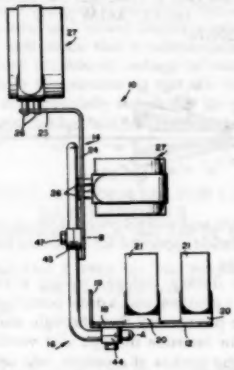
a ridge on said lower bushing member projecting therefrom and engageable with said front edge of the impact bar and said lower mounting bar upon movement thereof to a position selected to prevent further movement and hyperextension of the knee.

4,691,698

TIBIAL TORSION SPLINT WITH MULTIPLE DEGREES OF FREEDOM OF ADJUSTMENT

Ross L. Bremer, c/o 433 Margaret St., Jacksonville, Fla. 32204

Filed Apr. 16, 1986, Ser. No. 852,819
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—80 R **20 Claims**



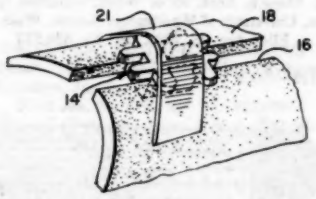
1. A tibial torsion splint comprising:
a foot plate adapted to receive the foot of a user;
leg support means for supporting a user's leg adjacent both the upper and lower parts of the user's knee;
frame means interconnecting said plate and said leg support means;
first means for connecting said foot plate to said frame means for rotation of said foot plate about axes respectively generally perpendicular and parallel to said plate;
second means for adjusting the position of said leg support means with respect to said foot plate to accommodate users having tibias of different length; and
third means for adjusting the rotational position of said leg support means with respect to said frame means about an axis generally parallel to the plane of said foot plate and spaced from the first mentioned axis generally parallel to said plate, to accommodate users with knock-knees, or related conditions.

4,691,699

ORTHOPEDIC CAST SPACING AND SPREADING DEVICE

James W. Scott, P.O. Box 7630, Tifton, Ga. 31794, and John Hickox, 400 Northfield Rd., Valdosta, Ga. 31602

Filed Apr. 9, 1986, Ser. No. 849,715
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—91 A **8 Claims**



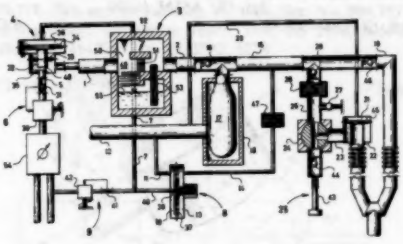
1. An orthopedic cast spacing and spreading device comprising:
a first orthogonal member having,
a generally planar first end face,
a second end face, and
mutually parallel side-wall surfaces extending between said end faces in a posture perpendicular to said first end face;
a second orthogonal member having,
a generally planar first end face,
a second end face, and
mutually parallel side wall surfaces extending between said end faces in a posture perpendicular to said first end face;
said second end face of said first orthogonal member being joined to said second end face of said second orthogonal member;
dimensions of said first orthogonal member transverse to a central longitudinal axis of said first orthogonal member being greater than dimensions of said second orthogonal member transverse to a central longitudinal axis of said second orthogonal member; and
at least one flange connected to said orthopedic cast spacing and spreading device at the junction of said first and second orthogonal members and laterally projecting outwardly from said first and second orthogonal members, wherein a orthopedic physician may selectively insert said first or said second orthogonal member into a longitudinal kerf cut into a patient's orthopedic cast to spread and maintain the kerf in a uniformly spaced posture with the lateral flange operably resting upon an outer surface of the cast.

4,691,700

ANAESTHETICAL CIRCUIT WITH REVERSE INHALATION EQUIPPED WITH AN INJECTOR OF ESCAPED ANAESTHETICS

Ondrej Brychta; Jozef Tlucko; Viktor Magdolen; Miroslav Brostik, all of Trencin, and Dusan Klimacek, Stara Tura, all of Czechoslovakia, assignors to Konstructa Trencin, narodny podnik, Trencin, Czechoslovakia

Filed Jun. 2, 1986, Ser. No. 870,140
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—200.21 **7 Claims**



1. An anaesthetical circuit having conduit means for conducting inhalation and exhalation gasses of a patient comprising
a source of constant flow having a feeding pipe connected thereto,
an injector having an inlet and an outlet,
valve means having an inlet and an outlet,
said feeding pipe connected from said source of constant flow into said valve means inlet,
an inlet pipe connected from the valve means outlet to said injector inlet,
a differential pressure indicator having a pressurized chamber and a vacuum chamber defined on opposite sides of a membrane therein,
a pressure energy source,
a drive pipe,
said energy source being connected to said pressurized

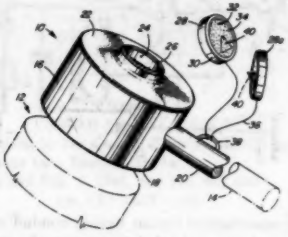
chamber of said differential pressure indicator from said drive pipe,
an opposing pipe and a connection pipe,
said opposing pipe connected from said connection pipe into said vacuum chamber which is on the opposing side of the pressurized chamber of said differential pressure indicator, said differential pressure indicator having means for generating a signal indicative of a predetermined pressure differential between said drive pipe and said connection pipe,
said valve means being responsive to said signal for opening said valve means,
said connection pipe also connecting from the outlet of said injector to said conduit means,
a rubber bag connected to said connection pipe and arranged in a cylinder hermetically sealed therearound, said drive pipe also connected into the cylinder,
a check valve in said connection pipe upstream of said rubber bag and opposing pipe providing one way flow from said injector,
an expiration valve conected to said conduit means and having a control chamber and an outlet pipe
a pipe connected from the drive pipe into said control chamber,
a distribution valve, into which said outlet pipe is connected,
said distribution valve having two branches,
one branch of said distribution valve forming an exhaust system,
said exhaust system being provided with a check valve providing one-way flow from said distribution valve,
the second branch of said distribution valve forming a runback pipe connected to said connection pipe,
said runback pipe comprising an overpressure valve connected through a carbon dioxide absorber and then through a check valve to the connection pipe.

4,691,701

CARBON DIOXIDE DETECTOR

R. Tudor Williams, 3423 Utah Crescent N.W., Calgary, Alberta, Canada T2N 4A9

Filed Jul. 28, 1986, Ser. No. 889,763
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.14 **6 Claims**



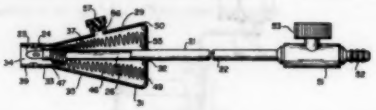
1. A carbon dioxide detector for use with an endotracheal tube or the like or an anaesthetic circuit comprising:
a housing having a first tubular member for connection to a endotracheal tube or the like;
a second tubular member for connection to said anaesthetic circuit, said first and second tubular members being in communication with the interior of said housing; and
means for indicating the presence of carbon dioxide in said detector comprising an aperture in said housing and in communication with said interior thereof and transparent disc means for sealingly engaging said aperture and thereby being in communication with said housing interior;
said disc means including a chemical substance which provides a colour change indication when exposed to carbon dioxide in said housing.

4,691,702

ASPIRATING DEVICE

Constantin B. Chantzis, Glen Rock, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 8, 1986, Ser. No. 916,358
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.16 **21 Claims**



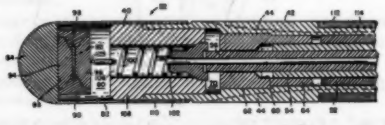
1. An operable aspirating device for use in conjunction with a patient ventilation apparatus for removing undesirable secretions comprising:
an elongate flexible catheter having a proximal portion including a proximal end, a distal portion including a distal end and a passageway therethrough, said catheter being adapted for insertion through said ventilating apparatus and into the trachea of a patient, said catheter having at least one aperture in said distal portion for allowing fluid communication between the exterior of said catheter and said passageway;
a patient housing including a proximal first end having a first opening, a distal second end having a second opening and a side wall therebetween defining a cavity in said patient housing, said catheter passing through said first opening and capable of passing through said second opening, said housing including means for connecting said housing to a patient ventilation apparatus so that said catheter may enter said patient ventilation apparatus through said second opening; and
a flexible sleeve surrounding a portion of said catheter having a far end connected at said distal portion of said catheter and a near end connected to said housing so that as said catheter is moved distally through said second opening said sleeve covers the portion of said catheter extending outwardly from said second opening between said second opening and said far end of said sleeve, said sleeve being capable of contacting the patient's trachea, said sleeve allowing rotational movement of said elongate catheter with respect to said housing, said sleeve being positioned so that when said catheter is moved proximally with respect to said housing said catheter moves through said first opening while leaving said sleeve within said housing.

4,691,703

THERMAL CAUTERY SYSTEM

David C. Auth, Redmond; Dale M. Lawrence, Lynnwood, and Tim R. Majoch, Kent, all of Wash., assignors to Board of Regents, University of Washington, Seattle, Wash.

Filed Apr. 25, 1986, Ser. No. 856,573
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **9 Claims**



1. A thermal cautery system comprising:
a thermal cautery probe having a heat-transfer portion

adapted to be placed in contact with tissue to be cauterized;

a diode mounted in said probe in thermal contact with said heat-transfer portion so that heat is transferred from said diode to said heat-transfer portion by conduction, said diode having a predetermined breakdown voltage at a predetermined temperature;

a pair of electrical conductors; and

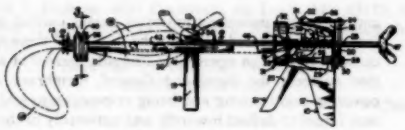
a power supply connected to said diode through said electrical conductors, said power supply applying an output voltage to said diode that is substantially equal to the predetermined breakdown voltage of said diode at said predetermined temperature so that the current through said diode is substantially reduced as the temperature of said diode approaches said predetermined temperature.

4,691,704

LIGATURE TOOL AND PROCESS FOR CASTRATING LARGE ANIMALS

Le Grand D. Wadsworth, Rte. 1, Box 168, St. Ignatius, Mont. 59865

Filed Oct. 3, 1986, Ser. No. 914,740
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—306 **6 Claims**



1. A tool for castrating animals having an external scrotal pouch by ligation, comprising, in combination:

a handle structure having an upper handle body with a perpendicularly depending handle element and associated trigger mechanism to move a tightening rod relative thereto;

an elongate body structure carried by a forward portion of the handle body and extending forwardly thereof with a forward plate structure in the forewardmost part of the body, said foreward plate structure defining a medial axially aligned grommet hole therein;

tightening structure including an elongate tightening rod with a forward portion having means of releasably fastening ligation material thereto, said tightening structure having a tightening rod communicating through the handle structure and rearwardly thereof;

means associated with the handle structure to move the tightening rod rearwardly upon operation of the handle trigger mechanism and of restraining forward motion except upon operation of a release arm; and

means carried by the body structure for crimping a grommet carried in the grommet hole defined in the forward plate structure.

4,691,705

CALCULUS CRUSHING APPARATUS

Tsutomu Okada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

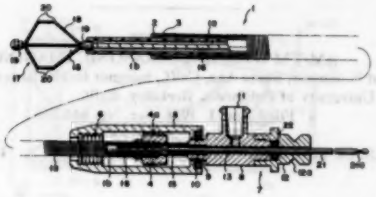
Filed Jan. 24, 1986, Ser. No. 822,019
Claims priority, application Japan, Feb. 8, 1985, 60-22962
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—328 **8 Claims**

1. A calculus crushing apparatus for crushing a calculus produced in the body cavity, comprising:

a flexible sheath adapted to be inserted to be inserted in the body cavity, said sheath including a first sheath having a predetermined mechanical strength sufficient to impart a calculus-crushing force, and a second sheath which is weaker but more flexible than the first sheath, said first and second sheaths being coaxial and movable relative to each other between a first positon where the distal end of the first sheath extends at least to the distal end of the proximity of second sheath, and a second position where the second sheath projects beyond the distal end of the first sheath;

supporting means for supporting the first and second sheaths to be movable relative to each other;

an operating wire slidably inserted in the flexible sheath and adapted to be pushed and pulled from the proximal end side of the sheath;



a collapsible basket for seizing and crushing the calculus, said basket being formed of a plurality of resilient wires connected to the distal end portion of the operating wire, and adapted to be projected from and drawn into the distal end portion of the flexible sheath for expansion and contraction in accordance with the movement of the operating wire; and

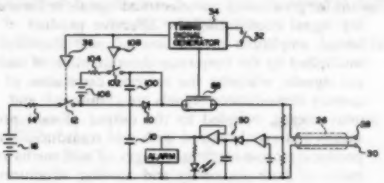
retaining means for holding the first and second sheaths in the first position in crushing the caluculus seized by the basket.

4,691,706

CALCULUS DISINTEGRATING APPARATUS

Syuichi Takayama, Tokyo, Japan, assignor to Olympus Optical Co., Tokyo, Japan

Continuation of Ser. No. 723,050, Apr. 15, 1985, abandoned, which is a division of Ser. No. 449,699, Dec. 14, 1982, Pat. No. 4,535,771. This application Aug. 22, 1986, Ser. No. 899,787
Claims priority, application Japan, Dec. 22, 1981, 206107; Dec. 26, 1981, 214252; Jan. 19, 1982, 6576
Int. Cl.[4] A61B *17/22, 17/36*
U.S. Cl. 128—328 **2 Claims**



1. A calculus disintegrating apparatus, which comprises:

first and second electrodes provided separately from each other;

first discharge energy means including a first D.C. power source and a first capacitor arranged to be charged by said first D.C. power source; said first discharge energy means being connected to said first and second electrodes to apply a D.C. impulse voltage across said first and second electrodes when said first capacitor is discharged;

switching means having two ends, one end thereof being connected to said first electrode, said switching means being operable so as to be conductive between said two ends thereof;

means for selectively rendering said switching means conductive;

second discharge energy means including a diode, a second D.C. power source, and a second capacitor arranged to be charged by said second D.C. power source; a cathode of said diode and a first terminal of said second capacitor being connected to another end of said switching means; and a second terminal of said second capacitor and an anode of said diode being connected to said first capacitor;

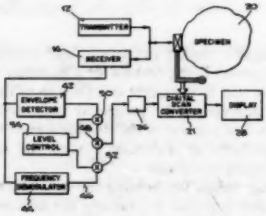
whereby said D.C. impulse voltage from said first capacitor and said D.C. impulse voltage from said second capacitor are superposedly applied across said first and second electrodes when said switching means is rendered conductive.

4,691,707

AM/FM HYBRID ULTRASONIC IMAGING

Pat V. Sankar, Santa Ana, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 1, 1986, Ser. No. 846,868
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **14 Claims**



1. A high resolution ultrasonic acoustic system for imaging reflected or scattered acoustic signals from a non-homogeneous media supporting acoustic pulse propogation comprising:

transmitter means for generating pulse signals;

transducer means coupled to said transmitter means for transmitting acoustic pressure signals into said media, and for receiving acoustic pressure signals reflected from said media in response to the transmitted acoustic pressure signal;

receiver means coupled to said transducer means for transforming the reflected acoustic pressure signals into electrical signals;

means for processing said electrical signals to form an imaging signal constituting the effective product of the detected amplitude modulation of said electrical signals multiplied by the frequency demodulation of said electrical signals; whereby the extreme excursions of the frequency demodulated signals are eliminated; and

display means, coupled to the output of said processing means and synchronized with said transducer means, for producing cross-sectional images of said media representative of both stationary and moving structures in said media.

4,691,708

OPTICAL PRESSURE SENSOR FOR MEASURING BLOOD PRESSURE

James Kane, Miami, Fla., assignor to Cordis Corporation, Dade, Fla.

Filed Mar. 10, 1986, Ser. No. 838,125
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—667 **7 Claims**

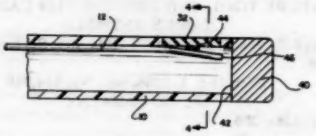
1. Apparatus for measuring blood pressure in a cardiovascular system and comprising:

an elongated tubular catheter having a lumen and having a proximal end and a distal end with the latter being adapted to be inserted into a passageway within a cardiovascular system;

an elongated optical fiber having a proximal end and a distal end and carried within the lumen of said catheter and extending throughout substantially the entire length thereof for receiving light at the proximal end of said catheter and transmitting it to the distal end thereof;

light reflecting means located at the distal end of said catheter and having a flat light reflecting surface fixed in position forwardly of the distal end of said optical fiber for receiving light from the distal end of said optical fiber and reflecting at least a portion of the light back to the optical fiber for receiving light from the distal end of said optical fiber and reflecting at least a portion of the light back to the optical fiber for transmission to the proximal end of said catheter;

means for modulating the intensity of light reflected back to the proximal end of said catheter as a function of pressure forces acting transversely of the distal end of the catheter



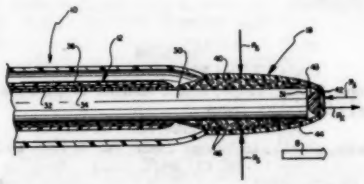
and including pressure transducer means carried by the catheter and located adjacent the distal end thereof, said catheter having an opening to one side thereof at a location adjacent the distal end thereof, membrane means covering said opening and being responsive to said pressure forces to deflect inwardly and outwardly of the catheter in dependence thereon, biasing means interposed between said membrane means and the distal end of said optical fiber for biasing the distal end of the optical fiber inwardly of said catheter so that the optical axis at the distal end of said fiber normally makes a greater than 90° angle with said flat light reflecting surface of said light reflecting means with said angle increasing with increased pressure forces and decreasing with reduced pressure forces to thereby modulate the intensity of light reflected from said reflecting means into the distal end of said optical fiber for transmission to the proximal end thereof.

4,691,709

APPARATUS FOR MEASURING VELOCITY OF BLOOD FLOW IN A BLOOD VESSEL

Donald M. Cohen, Encino, Calif., assignor to Cordis Corporation, Dade, Fla.

Continuation-in-part of Ser. No. 881,476, Jul. 1, 1986, which is a continuation of Ser. No. 671,913, Nov. 16, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 911,375
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—667 **14 Claims**



1. Apparatus for use in a device for measuring the velocity of blood flowing in a blood vessel in a body, comprising:

an elongated tubular catheter having a proximal end and a distal end with the latter adapted to be inserted into a blood vessel such that said blood flows parallel to said catheter;

an elongated optical fiber member carried within said catheter and having a proximal end and a distal end and extending throughout essentially the length of said catheter;

first pressure transducer means carried by said catheter adjacent the distal end thereof and responsive to static pressure acting transversely of said catheter for modulating the intensity of any light passing through said optical fiber inversely proportional to the magnitude of said transversely acting static pressure; and

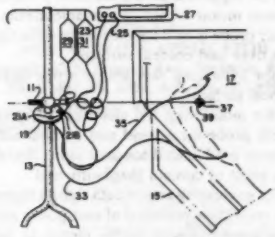
second pressure transducer means carried by said catheter at the distal end thereof and responsive to total pressure, including static pressure and kinetic pressure, acting parallel to said catheter, for modulating the intensity of any light passing through said optical fiber proportional to the magnitude of said total pressure, whereby the velocity of blood in said vessel can be determined as a function of the difference between said total pressure and said transversely acting static pressure.

4,691,710

MEDICAL APPARATUS AND SYSTEM

Judith F. Dickens, 3427 Pestalozzi, St. Louis, Mo. 63118, and John J. Loughlin, 8145 Whitburn, St. Louis County, Mo. 63105

Filed Feb. 18, 1986, Ser. No. 830,080
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—673 **9 Claims**



1. In a system for measuring internal pressures of a patient, said system including a pressure transducer fixedly mounted with respect to an IV pole or the like, and a catheter having a lumen forming a fluid path between the pressure transducer and a point in the patient at which the pressure is to be measured, the improvement comprising:

light source means for casting a light pattern upon a patient;

level means for indicating when the light source means is level;

a hollow body having at least one port fixedly receiving the light source means and an opening fixedly receiving the level means so that the body holds the light source means and the level means in fixed geometrical relationship with respect to each other;

a clamp secured to the body for fixedly securing the body to the IV pole or the like at a fixed elevation with respect to the pressure transducer;

said body being pivotable about an axis defined by the clamp for levelling the light source means once the body is fixedly secured to the IV pole.

4,691,711

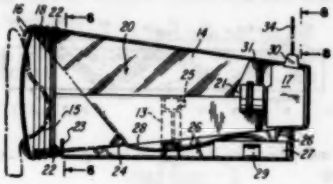
Patent Not Issued For This Number

4,691,712

DEVICE FOR DETECTING, MEASURING, AND RECORDING BODY THERMAL EMISSIVITY

George T. Brown, Jr., Dayton, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio

Continuation of Ser. No. 515,503, Jul. 20, 1983, Pat. No. 4,524,779. This application Jun. 20, 1985, Ser. No. 747,017
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] G03B *29/00*
U.S. Cl. 125—736 **19 Claims**



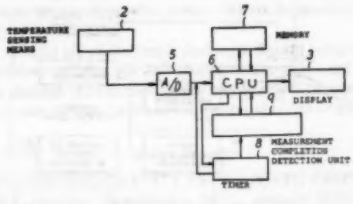
1. A device for detecting and recording the thermal emissivity of a human body, comprising a housing having opposite forward and rearward end portions, a flexible thermal responsive screen adapted to conform to the contour of the body and having a coating of liquid crystals effective to transform thermal differentials emanating from the body to visible color patterns, a resilient frame mounted on said forward end portion of said housing and supporting said flexible screen, said frame being conformable to the contour of the body in response to pressure of the body against said frame, camera means for recording the image of the patterns, means mounted on said rearward end portion of said housing for supporting said camera means, said housing cooperating with said screen and frame to define a chamber, and means for applying a fluid pressure against said flexible screen and cooperating with said resilient frame to conform said screen to the contour of the body.

4,691,713

ELECTRONIC CLINICAL THERMOMETER

Takashi Suzuki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1986, Ser. No. 830,081
Claims priority, application Japan, Feb. 21, 1985, 60-34131
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—736 **4 Claims**



1. An electronic clinical thermometer comprising:

temperature sensing means for sensing actual temperature values;

prediction means responsive to said temperature sensing means for calculating a prediction temperature value based on the actual temperature values; and

output control means for selectively outputting the actual temperature values or the prediction temperature value depending on the changes of the actual temperature values, said prediction temperature value taking less time for output than said actual temperature values.

4,691,714

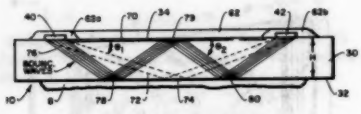
RHEOLOGICAL TESTING APPARATUS AND METHOD

Jacob Y. Wong, Santa Barbara; Pierre Khuri-Yakub, Palo Alto; M. Ed Motamedi, Thousand Oaks, and Marcus Y. Wong, Pacific Palisades, all of Calif., assignors to Adamtek Corporation, Santa Barbara and Hibshman Corporation, San Luis Obispo, both of, Calif., a part interest

Continuation of Ser. No. 661,226, Oct. 15, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 850,077

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—738 **24 Claims**



23. An instrument for rheological testing of cervical liquid comprising:

(a) a sensing transducer comprising an inert slab having a first face exposable to the liquid, wave generating means on a second face of the slab for generating a bulk wave toward the first face, receiving means on the slab in the path of the bulk wave after it reflects from the first face for receiving the reflected bulk wave from the first wave and generating a first output, first circuit means attached to the receiving means for measuring the amplitude of the first output and comparing the first output to a reference output whereby the difference between the first output and the reference output is a function of the viscosity of the liquid in contact with the first face; and

(b) support means for supporting the sensing transducer with the first face exposable to the cervical liquid, the support means being of a shape for insertion into a vagina for positioning the sensing transducer in contact with the cervical liquid.

4,691,715

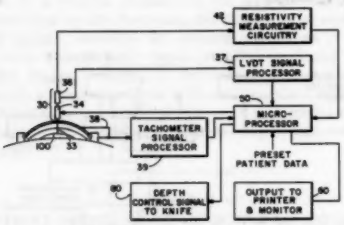
AUTOMATIC CORNEAL SURGERY SYSTEM

Emanuel Tanne, 6517 Buena Vista Dr., Vancouver, Wash. 98661

Division of Ser. No. 814,223, Dec. 27, 1985, Pat. No. 4,665,914. This application May 27, 1986, Ser. No. 867,034

Int. Cl.[4] A61B *5/10*; A61F *17/32*

U.S. Cl. 128—774 **24 Claims**



1. An automated corneal surgery system comprising:

(a) mapping means for measuring and mapping in two-dimensional coordinates the contour of the corneal surface by determining the positional location relative to a reference of a plurality of points distributed over the surface thereof, including means for generating data signals representative of the respective positions of said points;

(b) knife means with a movable blade for cutting into the corneal surface, including means for regulating the depth of penetration of said blade into the layers of the cornea; and

(c) microprocessor means, responsive to said data signals, for providing automated control of the cutting action of said knife means.

4,691,716

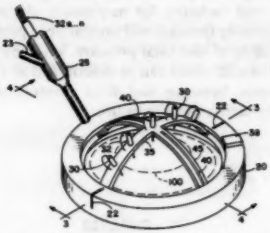
AUTOMATIC CORNEAL SURGERY SYSTEM

Emanuel Tanne, 6517 Buena Vista Dr., Vancouver, Wash. 98661

Division of Ser. No. 814,223, Dec. 27, 1985, Pat. No. 4,665,914. This application May 27, 1986, Ser. No. 867,039

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—774 **9 Claims**



1. An apparatus for mapping the contour of the corneal surface of the eye comprising:

(a) sensor probe means adapted to be juxtaposed above the corneal surface for determining the positional location relative to a reference of a plurality of points distributed over the surface of the cornea, said sensor probe being mounted on support means attachable proximate the eye, said support means including movable means for moving said sensor probe in two dimensions to differing measuring locations over said corneal surface;

(b) means for advancing said sensor probe means closer to said corneal surface;

(c) means for monitoring the electrical resistivity between said sensor probe means and said corneal surface as said probe means is advanced towards same, thereby to determine the point of contact therewith; and

(d) means for generating sets of data signals representative of both the respective positions of said points and the extent of advancement of said probe means at said point of contact.

4,691,717

CIGARETTES

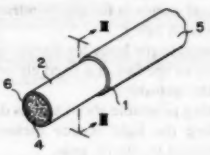
Sakio Ikeda, Nagareyama, and Shozen Yonamine, Yokohama, both of Japan, assignors to Dynic Corporation, Kyoto and Mine Kinzoku Kogyo K.K., Kanagawa, both of, Japan

Filed Aug. 30, 1984, Ser. No. 645,923

Claims priority, application Japan, May 4, 1984, 59-64744

Int. Cl.[4] A24D *1/02, 1/10, 1/12*

U.S. Cl. 131—365 **56 Claims**



1. A cigarette comprising:

a rod shaped core made up of tobacco; and

a perforated sheath surrounding said core and extending along at least a portion of the axial length of said core, said

perforated sheath having a helical rib on the outer surface thereof;

said perforated sheath being comprised of a material extending along said portion of said axial length of said core and which generates substantially less smoke when the cigarette is not sucked than when the cigarette is sucked.

4,691,718

TOOTHBRUSH

Shuji Sakuma, and Hirotaka Fujinawa, both of Tsukiji, Japan, assignors to Kabushiki Kaisha Sangi, Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,069

Claims priority, application Japan, Jun. 29, 1985, 60-141552

Int. Cl.[4] A61N *1/30*

U.S. Cl. 132—84 R **7 Claims**

1. A toothbrush comprising a bristle portion having bristles implanted therein, and a handle portion contiguous to said bristle portion, said bristle portion consisting of an ion eluting-type ceramic, said handle or bristle portion having a battery accommodated therein, a first conductor accommodated therein and connected to one pole of said battery, and a second conductor connected to the pole of said battery and fixedly secured to the surface of said handle, said iirst conductor extending into the interior of said bristle portion and exposing outward via at least one hole on said bristle portion.

4,691,719

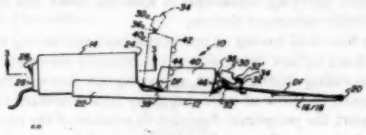
DENTAL FLOSS APPLICATOR

Angelo Ciccarelli, 32 N. Osprey Ave., Sarasota, Fla. 33577

Filed Mar. 28, 1986, Ser. No. 845,849

Int. Cl.[4] A61C *15/00*

U.S. Cl. 132—92 R **6 Claims**



1. A dental floss holder comprising:

an elongated main body having a top and bottom surface and a pair of extending spaced-apart opposing forks at one end and a refillable dental floss container disposed at the opposite end;

a floss lock bar pivotally connected at one end to a mid-portion of said top surface, the axis of said pivotal attachment generally transverse to said body;

each said fork having an eyelet at its distal end for receiving dental floss;

the lower surface of said floss lock bar having at least one protruding transversely disposed rib which is mateably receivable into a floss locking cavity in said body top surface when said floss lock bar is in a closed position;

said floss lock bar having a spring catch at its free end to releasably cooperate with a spring biased release pivotally mounted on said body top surface to hold said floss lock in a closed position;

the length of dental floss routable from a first aperture in a closed end of said dental floss container, between said rib and said cavity, along the length of one said fork and passing through each said fork eyelet such that the length of dental floss transversely spans and is held between said fork distal ends, then passing back along the length of the other said fork, between said rib and said cavity into a second aperture in said floss container closed end and exiting a third aperture in a removable cap of said floss container;

the outer surface of said removeable cap having a dental floss holder and cutter;

said rib and said cavity adapted to both tension and retain the so-routed dental floss when said floss lock bar is in the closed position.

4,691,720

APPLIANCE FOR PARTIALLY DYEING THE HAIR

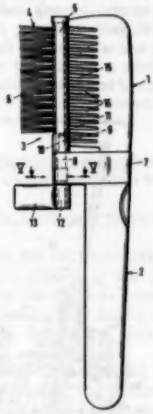
Wolfgang Schmitz, Aachener Strasse 609, 5000 Köln 41, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,468

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513814

Int. Cl.[4] A45D *24/22*

U.S. Cl. 132—112 **20 Claims**



1. An appliance for partially dyeing the hair, including a comb part (**1**), a handle part connected thereto and a dye applicator device (**3**) connected therebetween, wherein

the dye applicator device (**3**) comprises a brush device (**4**; **4***a*; **4***b*) including an element (**5**) supporting bristles **6**,

the element (**5**) is movable relative to the comb part (**1**) between a dye collecting position in which the bristles (**6**) point away from the comb part (**1**) and a dye dispensing position in which the bristles (**6**) are in contact with the comb teeth (**15**),

the bristles (**6**) of the brush device (**4**; **4***a*; **4***b*) being pointable substantially in one and the same direction, and

the element (**5**) supporting the bristles (**6**) is pivotable about an axis oriented substantially parallel to the comb part (**1**).

4,691,721

VOLUMETRIC GRAVITY FEED LIQUID DISPENSER

David L. Nystuen, Bloomington, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Filed Dec. 7, 1984, Ser. No. 679,259

Int. Cl.[4] B08B *13/00*

U.S. Cl. 134—96 **1 Claim**

1. A liquid dispenser for dispensing a constant volumetric quantity of liquid, said dispenser comprising:

(a) a plunger having a longitudinal axis;

(b) first and second substantially elastic umbrella seals cooperatively connected to said plunger, said seals in a spaced relationship;

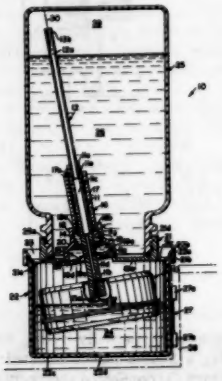
(c) a plunger housing enclosing at least a portion of said

plunger, said plunger housing adapted for relative movement with said plunger along said longitudinal axis, said plunger housing having an inner cavity having a first and a second opening, said inner cavity having a first and second sealing surface at said first and second openings, said seals positioned in said inner cavity, wherein a measuring chamber which holds a constant volume of liquid is defined between said seals, said first opening in fluid communication with the liquid to be dispensed, said first seal controlling fluid communication between said first opening and said measuring chamber and said second seal controlling fluid communication between said measuring chamber and said second opening;

(d) means for effecting relative movement along said longitudinal axis between said plunger and said plunger housing, said means comprising:

(i) a float cooperatively connected to said plunger; and

(ii) a housing having an inner cavity, wherein said plunger moves from a filling position to a dispensing position, wherein when in said filling position said second seal effects a liquid tight seal with said second sealing surface of said second opening and said first seal allows liquid to enter said measuring chamber through said first opening and when in said dispensing position said first seal effects a liquid tight seal with said second sealing surface of said first opening and said second seal



allows liquid to be dispensed by gravity from said second opening, said first seal always in a sealing relationship to said first opening when said second seal allows dispensing of liquid, whereby a constant volume of liquid is dispensed;

(e) said plunger housing comprises an upper portion having an inner bore sized larger than said plunger, wherein said upper portion acts as a guide for relative movement of said plunger and a seal is not effected between said plunger and said plunger housing;

(f) said first and second sealing surfaces at said first and second openings are conical;

(g) said seals having an opening proximate their center, said opening sized smaller that an outer dimension of said plunger where said seals are cooperatively connected, wherein a liquid tight seal is formed between said plunger and said seals;

(h) said plunger having annular grooves around which said seals are positioned, said grooves having a width that is substantially filled by said seals;

(i) said plunger having a bore with a first and second opening, said first opening cooperatively connected to a vent tube and said second opening in communication with atmospheric air;

(j) a stop cooperatively connected to said plunger to limit downward movement of said plunger;

(k) an adapter having an opening in which said plunger housing is cooperatively connected, said adapter having means for securing a container in which the liquid to be dispensed is contained; and

(l) said plunger housing is cooperatively connected to said adapter at an angle, wherein said plunger housing is at an angle with the horizontal when in use.

4,691,722

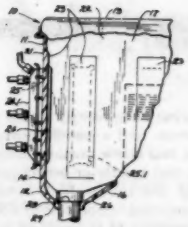
BOWL FOR LIQUID SPRAY PROCESSING MACHINE

James M. Silvernail, Maple Plain, and Clifford C. Miller, Bloomington, both of Minn., assignors to FSI Corporation, Chaska, Minn.

Filed Aug. 1, 1984, Ser. No. 636,724

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—155 **6 Claims**



1. A spray processing machine for confining and directing liquid sprays onto wafer substrates in the manufacture of electronic devices, comprising

a bowl having an open top, a peripheral side wall and base wall opposite the open top,

an openable cover cooperating with the bowl in defining a processing chamber,

rotor means in the bowl for mounting such wafer substrates and revolving the substrates,

means spraying liquid sprays into the bowl and onto the wafer substrates therein,

the base wall having an open drain port and having an upper drain surface being sloped peripherally downwardly in a spiraling configuration spray liquids toward the drain port, the flow of collected spray liquids toward the drain port, the peripheral direction of rotation of the rotor being the same as the peripheral direction of downward slope of the spiraling configuration, the base wall also having a step adjacent the drain port, the step defining a riser face, facing in a direction opposite to the rotation of the rotor, whereby the gaseous fluid turbulence induced in the processing chamber by revolving of the rotor assists and contributes to the flow of draining liquids downwardly along the spiraling configuration on the base wall until obstructed by the riser face of the step for rapid delivery into the drain port.

4,691,723

APPARATUS FOR CLEANING RADIOACTIVE TUBE BANKS

Christian Mierswa, Binzen, and Friedrich Schmutz, Weil am Rhein, both of Fed. Rep. of Germany, assignors to Ernst Schmutz GmbH, Weil am Rhein, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,258

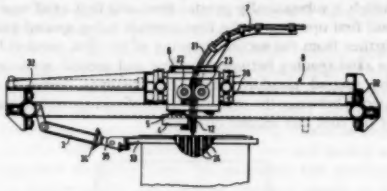
Claims priority, application Fed. Rep. of Germany, May 21, 1984, 34188355

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—167 C **6 Claims**

1. Apparatus for cleaning radioactive contaminated banks of tubular members which have open ends located in a plane, said apparatus comprising:

hose means for spraying a cleansing liquid,
feed means for feeding said hose means in a direction parallel to a longitudinal axis at said tubular members,
a cleaning carriage, said feed means being mounted on said cleaning carriage,
an intermediate carriage, said cleaning carriage being slidably mounted on said intermediate carriage,
first drive means for moving said cleaning carriage in a straight line on said intermediate carriage,



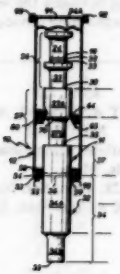
a main carriage, said intermediate carriage being slidably mounted on said main carriage,
second drive means for moving said intermediate carriage on said main carriage in a straight line normal to a direction of movement of said cleaning carriage,
a circular centering ring, said main carriage being rotatably mounted on said circular centering ring, and
third drive means for rotating said main carriage on said circular centering ring to thereby simultaneously rotate said cleaning carriage and said intermediate carriage.

4,691,724

ULTRASONIC DEVICE

Raoul Garcia, Paris; Daniel Michaux, Noisy-le-Sec, and André Sales, Bures-sur-Yvette, all of France, assignors to SCP Biscornet, Paris, France

Filed Oct. 23, 1985, Ser. No. 790,614
Claims priority, application France, Oct. 23, 1984, 84 16169
Int. Cl.[4] B08B *9/00*; H01L *41/04*
U.S. Cl. 134—169 R **18 Claims**



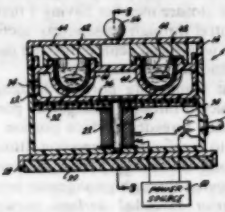
1. Ultrasonic device comprising at least one ultrasonic transducer and a probe having an active part adapted to be immersed in a medium, said active part including an adapter part having a surface for matching the impedance of said probe to the medium, said adapter part surface having an end face and said active part extending longitudinally between said end face of said adapter part and a limiting part beyond said active part, said probe being adapted to carry longitudinal ultrasonic waves and radial ultrasonic waves generated by said ultrasonic transducer, said limiting part being located at a node of the longitudinal ultrasonic waves and said end face being located at a peak of the longitudinal ultrasonic waves, the longitudinal dimension of said active part being such that in operation at least one peak of the radial ultrasonic waves will be formed along said active part intermediate said limiting part and said end face.

4,691,725

LENS CLEANER

Tulio T. Parisi, San Diego, Calif., assignor to Ultramed Corporation, San Diego, Calif.

Filed May 13, 1985, Ser. No. 732,926
Int. Cl.[4] B08B *3/12*
U.S. Cl. 134—184 **13 Claims**



1. In combination for cleaning a contact lens with a cleaning fluid,
a housing,
means disposed in the housing in displaceable relationship to the housing for holding the contact lens and the cleaning fluid,
means disposed in the housing for producing electrical pulsations,
means responsive to the electrical pulsations for vibrating the holding means relative to the housing to obtain a movememt of the contact lens relative to the holding means and the cleaning fluid and to obtain a cleaning of the contact lens by the cleaning fluid during such movement, and
resilient support means for the holding means, and
means responsive to the electrical pulsations for pressing the holding means against the resilient support means during the production of the electrical pulsations and for providing for the release of the pressure of the holding means against the resilient support means during the period of time between successive electrical pulsations.

4,691,726

METHOD AND APPARATUS FOR VALVE ASSEMBLY FOR A HOT WATER TANK

Robert L. Studer, 6116 NE. 87th St., Redmond, Wash. 98052, and William E. Schourup, 23234 NE. 54th, Redmond, Wash. 98053

Continuation-in-part of Ser. No. 528,721, Aug. 31, 1983, Pat. No. 4,508,130. This application Aug. 13, 1984, Ser. No. 640,687
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—15 **20 Claims**

1. A method of installing a valve in a water distribution network of an existing plumbing system where there is:
(a) a distribution pipe having an upstrean end and a downstream outlet end, and also having an outside surface of a predetermined outside diameter, and an inside surface defining a passageway having a predetermined passageway diameter and passageway cross-sectional area;
(b) an existing shutoff valve located upstream of the upstream end of the distribution pipe;
said method comprising:
(a) determining an installation location where the valve is to be installed in the plumbing system;
(b) operating said existing shutoff valve to stop flow of water to said installation location;

(c) providing said distribution pipe at said installation location with an open pipe end portion which is substantially undistorted and provides a substantially uninterrupted through passageway portion, without enclosing said installation location in a watertight containment and with said installation location being open to the surrounding environment;

(d) providing a valve assembly comprising:

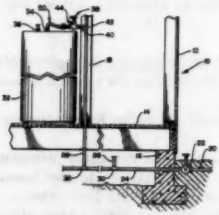
(1) a valve comprising:

(i) a main body portion defining a central through passageway section having a cross-sectional area at least as great as that of the pipe passageway;

(ii) a valve closure member having a first position closing said central through passageway section and a second position where said central through passageway section is substantially unobstructed;

(iii) a first connecting portion defining a substantially unobstructed through passageway portion, and having an exterior threaded surface portion with threads arranged to receive a compression fitting;

(iv) a second connecting portion defining a substantially unobstructed through passageway portion, and having an exterior threaded surface portion with threads adapted to receive a conventional plumbing connecting member with interior threads;



(2) a compression nut having an annular integral structure, with an inner threaded surface to engage the threaded surface portion of said first connecting portion, and having a through opening to receive said pipe end portion;

(3) an annular compression seal member adapted to be positioned adjacent said pipe end portion in sealing engagement with said first connecting portion and said pipe end portion;

(e) inserting said valve at said installation location, with said compression nut and said seal member being placed adjacent said pipe end portion and with said first connecting portion being in connecting relationship with said pipe end portion and threading said nut onto said first connecting portion to bring said seal member in sealing relationship with the pipe end portion;

(f) interconnecting said valve to an end use component to which water is to be delivered, by threading a conventional interiorily threaded connecting member onto said second connecting portion, with said conventional interiorly threaded member being connected to said end use component;

(g) opening said existing shutoff valve.

4,691,727

FLOW CONDITIONING DEVICE RESETTER ASSEMBLY

Larry D. Zorb, and L. Harvey Wicklund, both of Big Fork, Mont., assignors to A. Y. McDonald Manufacturing Co., Dubuque, Iowa

Filed Nov. 4, 1985, Ser. No. 794,283

Int. Cl.[4] F16L *55/07*; G01F *15/18*

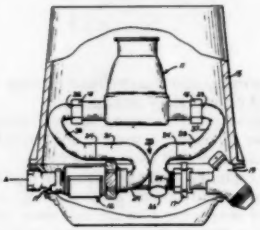
U.S. Cl. 137—15 **36 Claims**

1. A resetting device for mounting a first flow conditioning device along a remote axis spaced from and substantially parallel to a main line axis defined by main line pipes, and for allowing a second flow conditioning device to be mounted between the resetting device and a main line pipe; comprising:

a first conduit having a first opening along a first axis, and a second opening along a reset axis;

a second conduit having a first opening along said first axis, and a second opening along said reset axis;

said first openings of the first and second conduits being spaced by a first axial spacing along the first axis; said second openings of the first and second conduits being spaced by a second axial spacing along the reset axis which is substantially greater than said first axial spacing; said first opening of the first conduit being spaced axially further from the second opening of the first conduit than an axial spacing between the first and second openings of the second conduit; said first openings being axially spaced between the axial positions of said second openings of the first and second conduits;



said first axis and said reset axis being substantially parallel and defining a first plane; said first and second conduits running laterally outward from said first plane along intermediate portions thereof with the conduits convoluting between the first and second openings thereof;

said first openings of the first and second conduits being outwardly facing in opposing directions, and said second openings of the first and second conduits being inwardly facing towards one another; and

in which a connection spacing between a first opening of the first or second conduits and a distal opening of the second flow conditioning device is approximately equal to said second axial spacing between the second openings, when the second flow conditioning device is connected to a first opening.

4,691,728

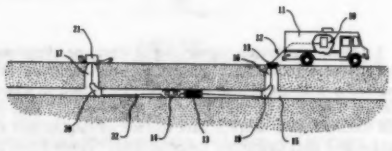
ELECTRONIC TEST AND SEAL APPARATUS AND METHOD

Allen D. Mathison, Richfield, Minn., assignor to Cherne Industries, Inc., Minneapolis, Minn.

Filed May 28, 1986, Ser. No. 868,129

Int. Cl.[4] F16K *43/00*; F16L *55/16, 55/18*

U.S. Cl. 137—15 **20 Claims**



16. A method for automatically testing and sealing a pipeline seaction of a predetermined diameter from a remote location comprising:

a. providing an inflatable packer device of a predetermined size, the packer device having inflatable end elements, an exterior sleeve member, a chemical dispensing mechanism and having hose assembly connecting means,

b. providing a compressed air source, a pressurized test fluid source, a sealing chemical source and a catalyst source,

c. providing a hose assembly having a packer sleeve air line, an end element air line, a catalyst and test fluid line and a chemical sealant line,

d. providing a first pump means in operative communication with the sealing chemical component source and the chemical sealant line, a second pump in operative communication with the catalyst source and the catalyst and test fluid line and a valve in operative communication with the test fluid source and the catalyst and test fluid line at a location beyond the second pump,

e. providing an electronically operated control panel in operative communication with the compressed air source, the sleeve air line, the end element air line, the valve and the first and second pumps, said control panel further having pneumatic pressure monitoring means in communication with the packer sleeve air line and having a first regulator means to preset the pneumatic test pressure for the packer sleeve and a second regulator means to preset the pneumatic seal pressure for the packer sleeve, said electronic control panel further having electronic circuitry to yield only electrical output signals including a first pressure differential sensor to monitor the pressure difference between the actual sleeve pressure and the preset test pressure and a second pressure differential sensor to monitor the difference between the actual sleeve pressure and the preset sleeve pressure,

f. setting the first and second pressure regulator means for the selected packer device and for the diameter of the pipeline section diameter, and

g. turning the electronic control panel to its operative position whereby the testing and sealing functions of the packer device are automatically controlled by the electrical output signals operative on the valve and the first and second pump means.

4,691,729

REVERSE-BUCKLING RUPTURE DISK WITH REPLACEABLE DISK AND BLADE

Miner E. Clift, P.O. Box 1327, Broken Arrow, Okla. 74012

Continuation of Ser. No. 617,893, Jun. 6, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,569

Int. Cl.[4] F16K *17/14*

U.S. Cl. 137—68.1 **5 Claims**

1. A rupture disk assembly comprising:

a. housing means defining a bore for conveying flow and comprising a pair of abutting annular sections;

b. a frangible concave-convex disk supported at its edge portions between the annular sections, closing the bore, the disk being designed to resist pressure on the convex side up to a predetermined pressure and then collapsing after the predetermined pressure is reached;

c. means for temporarily assembling the annular sections and disk together so that the disk can be removed after rupturing and replaced with another disk; and

d. an elongated U-shaped knife blade with two ends positioned within the bore on the concave side of the disk and spaced downstream therefrom, the blade comprising a flat blade body with an upstream leading edge and a downstream trailing edge that are spaced from the wall of the bore and a plurality of teeth lining the leading edge for perforating the disk when it collapses, the ends of the blade being connected to the inner surface of the housing means on one side of the lateral centerline of the bore and wherein the knife blade is removably connected to the housing means so that it can be replaced independently of the disk.

4,691,730

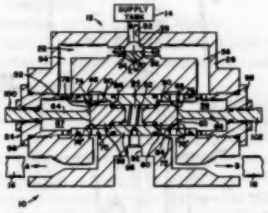
CONSTANT PERCENTAGE FLOW DIVIDER

Larry A. Portolese, Granger, and Thomas M. Leathers, South Bend, both of Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 19, 1986, Ser. No. 909,440

Int. Cl.[4] G05D *11/03*

U.S. Cl. 137—101 **9 Claims**



1. A flow control device for supplying at least first and second fluid distribution systems with a constant percentage of fluid flowing from a single source of fluid comprising:

a housing having a first bore and a second bore, said first bore being connected to said single source of fluid through an inlet orifice and to said second bore through first and second passages that extend from first and second outlet orifices, respectively, said second bore having first and second outlet ports connected to said first and second distribution systems;

a shaft located in said first bore having a semi-cylindrical section transversely located with respect to said first and second outlet orifices for establishing said percentage of fluid flow to each of said first and second outlet orifices;

means for moving said semi-cylindrical section of said shaft such that a change in the flow area through one of said first and second orifices causes a corresponding change in the other of said first and second orifices so that the total volume of flow through said inlet orifice remains constant;

indicia on said housing to provide a reference to inform the operator of the position of said semi-cylindrical section of said shaft with respect to said first and second outlet orifices;

a first piston located in said second bore and having a first area exposed to the fluid in said first passage;

a second piston located in said second bore and having a second area exposed to the fluid in said second passage;

adjusting means located in said second bore for aligning said first and second pistons with respect to said first and second outlet ports to assure that flow from said second bore simultaneously occurs through the first and second outlet ports; and

resilient means located between said first and second pistons

for urging said first and second pistons toward said adjusting means, said pressure of the fluid in said second bore being required to overcome said resilient means before any flow occurs through said first and second outlet ports, said first and second pistons responding to any differences in the fluid pressure between the first and second distribution systems by moving to correspondingly change the area of flow through said first and second outlet ports such that the volume of fluid flowing through the first and second outlet ports corresponds to the percentage established by said means in said first bore.

4,691,731

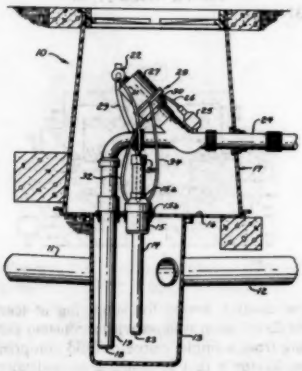
VACUUM SEWERAGE SYSTEM WITH IN PIT BREATHER

John M. Grooms, Rochester, and Mark A. Jones, Cloverdale, both of Ind., assignors to Burton Mechanical Contractors, Inc., Rochester, Ind.

Continuation-in-part of Ser. No. 559,198, Dec. 8, 1983, abandoned. This application Jun. 12, 1985, Ser. No. 743,751

Int. Cl.[4] E03F *1/00*

U.S. Cl. 137—205 **10 Claims**



1. Apparatus for sewage flow control in a normally sub-atmospheric pressure sewerage transport system comprising:

a sewage accumulation receptacle for sub-surface installation and for collecting sewage for discharge into the transport system,

the receptacle being adapted for sub-surface connection to conduit means communicating with a remote pressure source to maintain the receptacle before and after discharge at a pressure level above the normal sub-atmospheric pressure of the transport system,

a differential pressure operated flow control valve adapted to sequentially open and close in response to pre-selected pressure levels and to facilitate the discharge of sewage from the receptacle into the sewerage transport systems, and

means between the valve and the receptacle for sub-surface installation and to provide continuous communication of at least two pressures developed in the receptacle with the differential pressure operated flow control valve for sequential operation thereof, one of the pressures including the pressure level above normal sub-atmospheric pressure maintained in the receptacle through its connection to the remote pressure source whereby the receptacle and the differential pressure operated control valve may be maintained entirely sub-surface without air vent or other conduits openly protruding above grade level.

4,691,732

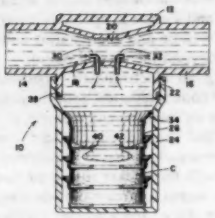
POOL CHLORINATOR

Bruce R. Johnson, Sebastopol, and Ralph A. Falconer, Novato, both of Calif., assignors to Jandy Industries, Inc., Novato, Calif.

Filed Aug. 1, 1986, Ser. No. 892,037

Int. Cl.[4] B01D *11/02*

U.S. Cl. 137—268 **4 Claims**



1. A chemical dispenser for a pool or spa comprising:

a receptacle receiving a stack of dry, soluble chemical tablets;

coupling means on said receptacle adapted for connection into a water circulation line;

inlet and outlet ducts for introducing water from said coupling means into said receptacle at one end of said receptacle and for returning water from said one end to said coupling means; and

sealing means comprising a plurality of annular seal members, each engaging around and between one of said chemical tablets in said stack thereof and the inner wall of said receptacle to prevent flow of water from said one end of the receptacle past that tablet closest thereto.

4,691,733

UNDERCOVER VALVE COVER ASSEMBLY AND VALVE SUPPORT

Frank R. Zinn, Culpeper, Va., assignor to Bingham & Taylor, Culpeper, Va.

Filed Jul. 3, 1986, Ser. No. 881,778

Int. Cl.[4] F16L *5/00*

U.S. Cl. 137—364 **5 Claims**

1. A valve cover assembly for covering a buried valve for a pipe section and permitting access thereto comprising:

a hollow elongated valve cover means having a pair of opposed longitudinal slots therein extending upwardly from a lower end thereof;

a valve support member adapted for slidingly receiving said valve cover means having opposed longitudinal slots extending downwardly from an upper end thereof, and a pair of outwardly extending portions beneath said opposed slots of said valve support member and extending from opposite sides of a lower portion of said valve support member, said outwardly extending portions having a

width which is less than the width of said opposed longitudinal slots of said valve cover means;

whereby a valve member having pipe extending outwardly from both sides thereof may be placed within said valve support member with said pipe being disposed within said opposed slots of said valve support member, and said valve cover means may be slid over said valve support member, said longitudinal slots of said valve cover means providing a passage through which the outwardly extending pipe passes, and tightly receiving said outwardly extending portions so as to secure the valve cover means firmly to said valve support member.

4,691,734

VALVE SEALS

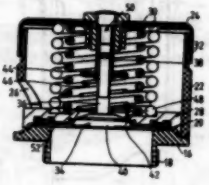
Edward S. Fort, Clitheroe, England, assignor to Fort Vale Engineering Ltd., Nelson, England

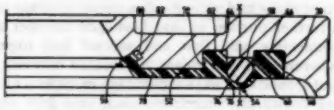
Filed Mar. 28, 1986, Ser. No. 845,972

Claims priority, application United Kingdom, May 21, 1985, 8512829

Int. Cl.[4] F16K *17/196, 1/44*

U.S. Cl. 137—493.4 **11 Claims**





1. A pressure relief valve adapted in use to relieve excess pressure within a vessel, comprising a valve sea, a movable valve member resiliently biased towards the valve seat to maintain the pressure relief valve in a normally closed condition, and a valve seal carried by the movable valve member and disposed between the movable valve member and the valve seat, in which the valve seal comprises an annular valve seal member having on one side an annular pressure sealing face which in the normally closed position of the movable valve member sealingly cooperates with the valve seat and on its other side two concentric annular rims which define between them an annular groove opposite said annular pressure sealing face, said concentric annular rims being received in corresponding concentric annular recesses in the movable valve member, locating means formed integrally of the annular seal member and disposed radially inwardly of the annular pressure sealing face for locating the annular seal member on the movable valve member, and includes a resilient biasing member received in said annular groove and acting between the movable valve member and the annular seal member to maintain the annular pressure sealing face in sealing contact with the valve seat when the movable valve member is in said normally closing position.

4,691,735

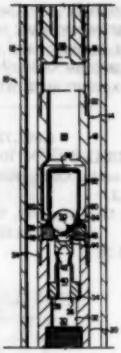
PLUNGER VALVE APPARATUS FOR OIL WELL PUMP

James B. Horton, P.O. Box 1758, Kilgore, Tex. 75662

Continuation of Ser. No. 732,625, May 10, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,563

Int. Cl.[4] F16K *15/04*

U.S. Cl. 137—494 **10 Claims**



1. A valve comprising:

a casing extending into a body of liquid;

valve seat means fixedly mounted within said casing;

a ball positioned within said casing above said valve seat means;

a piston movably mounted within said casing below said valve seat means and adapted for reciprocation within said casing in response to fluid pressure and wherein said valve is closed by said ball engaging said valve seat means, and opened by a drop in fluid pressure above said piston causing said piston to rise, thereby lifting said ball away from said valve seat means; and

a ball protection shield having a lower open end and an upper closed end fixedly mounted above said valve seat means and defining an enclosure in which said steel ball is contained, said shield having at least one aperture to permit fluid to flow through said shield, said aperture positioned entirely below the level to which said piston lifts the ball when said piston is in an elevated position.

4,691,736

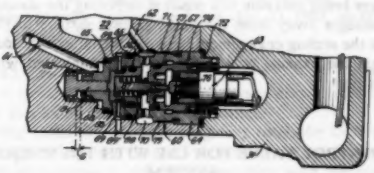
VALVE FOR FIRE SUPPRESSION

Slawomir Kowalski, Oak Ridge, N.J., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Dec. 3, 1986, Ser. No. 937,542

Int. Cl.[4] F16K *37/00*

U.S. Cl. 137—557 **6 Claims**



1. In a fire-suppressing valve wherein a valve member is normally poised in valve-closed position to retain a high-pressure suppressant charge in an upstream chamber in readiness for rapid discharge via a downstream chamber upon quick-opening displacement of the valve member, the improvement in which said valve carries an electrical switch which exhibits a change of switching state in response to mechanical displace-

ment of an actuating element between an unactuated position and an actuated position, and fluid-pressure-responsive movable-piston means operatively associated with the actuating element of said switch, said piston means having a relatively small-area head end connected for exclusive response to upstream-chamber pressure and a relatively large-area tail end connected for exclusive response to downstream-chamber pressure, venting means interposed between said head and tail ends, first seal means isolating said venting means from said head end and therefore isolating said head end for exposure to upstream-chamber pressure, and second seal means isolating said venting means from said tail end and therefore isolating said tail end for exposure to downstream-chamber pressure.

4,691,737

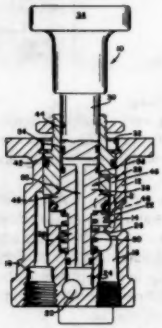
BRAKE CONTROL VALVE

Milan J. Sebo, Lorain, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 10, 1984, Ser. No. 679,781

Int. Cl.[4] F15B *13/04*

U.S. Cl. 137—625.26 **14 Claims**



1. Control valve comprising a housing having an inlet port for communication with a fluid pressure source, an outlet port, and an exhaust port, said housing defining a bore communicating with said inlet, outlet and exhaust ports, a valve operating plunger slidably mounted in said bore and having larger and smaller diameter portions defining a shoulder therebetween, a valve seating surface on said housing, a circumferentially extending groove on said shoulder, a circumferentially extending cavity in said plunger communicating with said groove, a circumferentially extending seal including a main body portion received in said cavity and a circumferentially extending bead projecting from said body portion of the seal through said groove for sealing engagement with the valve seating surface when the shoulder on the plunger is urged thereagainst to thereby seal off the exhaust from the inlet and outlet ports, said plunger being movable to a position disposing the shoulder on the plunger away from the valve seating surface to thereby break the sealing engagement between the latter and said bead so that the exhaust port is thereby communicated with the outlet port.

4,691,738

CONTROL VALVE FOR USE WITH TOURNIQUET SYSTEM

William L. McCune, Denver, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.

Filed Aug. 23, 1983, Ser. No. 525,600

Int. Cl.[4] F16K *7/06*

U.S. Cl. 137—627.5 **11 Claims**

1. In a valve including a housing with:

(a) first and second inlets;

(b) first and second outlets;

(c) a first flexible conduit fluidly connecting said first inlet with said first outlet;

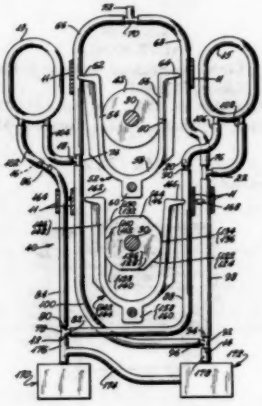
(d) a second flexible conduit fluidly connecting said second inlet with said second outlet;

(e) first and second valve means for controlling flow through the respective first and second conduits, said first and second valve means each including:

(i) rotatable cam means, and

(ii) pivoting means interposed between said cam means and the respective flexible conduit;

(iii) rotation of said cam means causing pivoting of said pivoting means to sequentially compress and release said flexible conduit, the improvement wherein, said pivoting means for said first and second valve means comprising a single U-shaped member mounted in surrounding relation to said cam means, a first leg of said



U-shaped member comprising said first valve means pivoting means, a second leg of said U-shaped member comprising said second valve means pivoting means and a further portion of said U-shaped member integrally connecting said first and second legs together and wherein said cam means are located between said first and second legs and each said leg includes a foot extending outwardly therefrom, each said foot engaging a respective flexible conduit and selectively compressing or releasing said respective flexible conduit, and wherein said cam means are located between said further portion and each said foot, and wherein said further portion is rigidly connected to said housing and said first and second legs pivot with respect to said further portion, and wherein said first and second legs and said further portion are integrally formed in one piece from a resilient material, said material inherently resisting said pivoting of said first and second legs.

4,691,739

BOOTSTRAP RESERVOIR

Richmond A. Gooden, Kettering, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

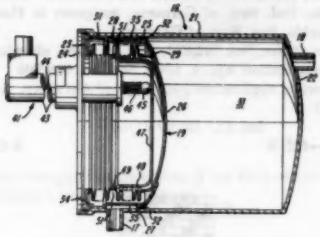
Filed Sep. 2, 1986, Ser. No. 902,687

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—31 **12 Claims**

1. A bootstrap accumulator-reservoir device for use in a closed system circulating liquid under pump pressure and having high pressure and low pressure system portions related respectively to pump output and intake sides, including a shell assembly providing a reservoir accommodating liquid expansion and contraction, means for communicating said reservoir

with a low pressure system portion, a piston assembly in said shell assembly for applying pressure to liquid in said reservoir, a metallic bellows stretched between said piston assembly and a stationary part of said shell assembly defining an annular pressure applying chamber surrounding said bellows and on a side of said piston assembly oppositely of said reservoir, and



means for communicating said annular pressure chamber with a high pressure system portion, one end of said metallic bellows being joined to said stationary part of the shell assembly in a manner to anchor said other bellows end and to preclude communication of said high pressure annular chamber with ambient surroundings.

4,691,740

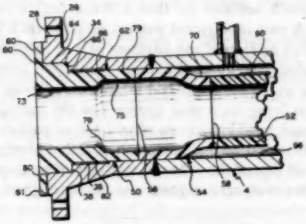
PIPELINE LINING

Harvey E. Svetlik, Dallas and Roy F. Wood, Carrollton, Tex., assignor to Phillips Petroleum Company, both of Bartlesville, Okla.

Continuation of Ser. No. 475,563, Mar. 15, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,483

Int. Cl.[4] F16L *55/18, 57/00, 58/00*

U.S. Cl. 138—109 **14 Claims**



1. A thermoplastic flange adapter for fusing to an end of a thermoplastic tube, said flange adapter having a first end and a second end and being characterized by an annular flange at the first end and a generally tubular portion attached normally to the annular flange, said tubular portion having an exterior surface defining a first generally cylindrical portion having a first end and a second end connected by its first end to the flange, a first outside diameter next to the flange and a second generally cylindrical portion having a first end and a second end connected by its first end to the second end of the first generally cylindrical portion, said second generally, cylindrical portion having a second outside diameter less than the first diameter, an annular shoulder separating the first diameter from the second diameter, wherein the tubular portion further defines a third generally cylindrical portion having a first end and a second end and a third outside diameter smaller than the second outside diameter connected by its first end via a flared or tapered shape to the second end of the second generally cylindrical portion with the second outside diameter being between the first generally cylindrical portion having the first outside diameter and the third generally cylindrical portion having the third outside diameter, the second end of the third generally cylindrical portion corresponding to the second end of the flange adapter to form a transition section for fusing the thermoplastic tube to the flange adapter.

4,691,741

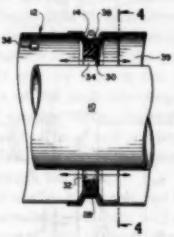
SHROUD FOR AIRCRAFT DUCT

Steven N. Affa, Valencia; Ira R. Newman, Sun Valley, and Robert S. Allison, San Gabriel, all of Calif., assignors to General Connectors Corporation, Burbank, Calif.

Division of Ser. No. 500,073, Jun. 1, 1983, and a continuation of Ser. No. 412,515, Aug. 30, 1982, abandoned. This application Jul. 12, 1985, Ser. No. 754,283

Int. Cl.[4] F16L *9/18*

U.S. Cl. 138—113 **4 Claims**



1. A shroud for a duct comprising a generally cylindrical resilient tube formed from an organic aramid fiber, said tube having an axially extending slot along its entire length whereby adjacent edges of the tube by the slot can be pulled apart so the tube can be inserted over a duct, at least one radially inwardly extending clamping band receiving groove situated transverse to the axis of said tube, said groove including a base which is radially inwardly spaced from the circumferential periphery of said cylindrical tube, said base adapted to receive a clamping band whereby the cylindrical shroud can be clamped to a duct mounted therein, a generally cylindrical spacer member formed from a selected elastomeric material mounted on the inner surface of said base member so the clamping band can clamp the shroud to said duct, said spacer member including a plurality of angularly spaced inwardly projecting abutments adapted to engage the peripheral surface of a duct defining thereby an insulating air gap between said shroud and the surface of said duct, the space between said angularly spaced inwardly projecting abutments defining channels through said spacer member for the passage of gases along the length of the air gap.

4,691,742

SURPLUS WARP YARN TREATING DEVICE OF LOOM

Masayuki Ushiro, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 31, 1985, Ser. No. 814,998

Claims priority, application Japan, Jan. 11, 1985, 60-1471[U]; May 17, 1985, 60-72150[U]

Int. Cl.[4] D03D *49/20*

U.S. Cl. 139—1 R **19 Claims**

1. A device for treating a surplus yarn drawn from a warp beam in a loom, said device comprising:

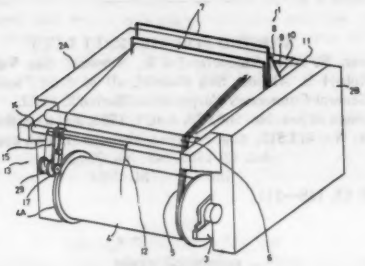
a first roller fixedly mounted on a rotatable shaft and in contact with and driven by a part of the warp beam;

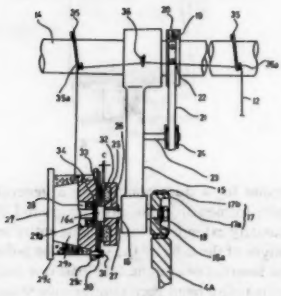
a drive member in drivable connection with the rotatable shaft and spaced from said first roller;

a driven member drivable by said drive member;

transmission means for drivingly connecting said drive member with said driven member so that said drive and driven members are rotatable relative to each other even during transmission of a rotational force from said drive member to said driven member; and

a take-up reel disposed separate from the warp beam and rotatable in timed relation to the warp beam by said driven





member, the surplus warp yarn drawn from the warp beam being wound up on said take-up reel.

4,691,743

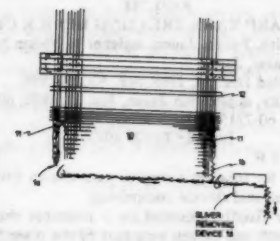
METHOD AND DEVICE FOR REMOVAL OF WASTE SLIVERS IN A WEAVING LOOM

Jean Venot, Mulhouse, France, assignor to Societe Alsacienne de Construction de Material Textile, France

Filed Jul. 23, 1986, Ser. No. 888,225

Int. Cl.[4] D03D *49/00*

U.S. Cl. 139—291 C **5 Claims**



1. A method for removing the two waste slivers by cutting the two false selvedges on the two lateral edges of a sheet of fabric woven on a loom, comprising coiling said two waste slivers in the form of spiral turns around a coiler, biasing said spiral turns against said coiler by applying a braking pressure to said spiral turns, and discharging said spiral turns from said coiler, wherein said two waste slivers are coiled in the form of a single cord, said cord being subjected to a false twist for automatically balancing the tensions of said two waste slivers.

4,691,744

FILTER WIRE CLOTH

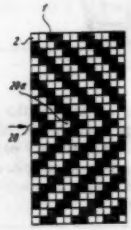
Eitel F. Haver; Heinz Lütke-Föller, and Reinhard Wössmann, all of Oelde, Fed. Rep. of Germany, assignors to Haver & Boecker, Oelde, Fed. Rep. of Germany

Continuation of Ser. No. 702,873, Feb. 19, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,906

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429021

Int. Cl.[4] D03D *15/02*

U.S. Cl. 139—425 R **8 Claims**



1. A wire mesh, formed as a filter mesh, of a twillplait weave, the wire mesh including individual interwoven single strand warp and weft wires being woven as a plurality of adjacent and consecutive pattern sections with each pattern section being woven as a twill pattern having diagonally running twill lines, the twill patterns in adjacent pattern sections having their twill lines running in different diagonal directions, and at least one intermediate wire woven between each pair of adjacent pattern sections so that a break region is formed between each pair of adjacent pattern sections each twill line of each pattern section of any adjacent pair of pattern sections defining included angles with their respective intermediate break region such that when said intermediate break region is considered as lying on a zero degree line the included angle defined by each twill line of one of said pair of pattern sections is an angle between zero degrees and negative ninety degrees and each twill line of the other of said pair of pattern sections is an angle between zero degrees and ninety degrees.

4,691,745

MULTI-NOZZLE WEFT INSERTION DEVICE FOR A FLUIDIC JET SHUTTLELESS-LOOM

Yujiro Takekawa, Ishikawa, and Fumio Matsuda, Kanazawa, both of Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan

Filed Dec. 4, 1985, Ser. No. 804,480

Claims priority, application Japan, Dec. 4, 1984, 59-257009

Int. Cl.[4] D03D *47/30*

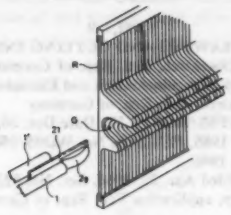
U.S. Cl. 139—435 **17 Claims**

1. A multi-nozzle weft insertion device for a fluidic jet shuttleless-loom, comprising:

a group of indepedent nozzles, each nozzle corresponding to a weft to be inserted, each nozzle having a jet orifice and the jet orifice pointing toward a weft-path including a line of sight; and

a streamlined weft guide provided at the jet orifice of at least one of said nozzles and having a streamlined wall surface forming a boundary layer flow as a fluid stream passes adjacent thereto, where a weft blown from the at least one nozzle being moved along the boundary-layer flow

formed on the streamlined wall surface of said weft guide, being blown gradually to the line of sight of the weft-path



and changing the direction of the fluid stream while maintaining a stable fluid stream.

4,691,746

FLAT WINDINGS, COIL FORMS, AND WINDING METHOD

Richard D. Sedgewick, 100 Horne St., Dover, N.H. 03820

Filed Sep. 30, 1985, Ser. No. 782,122
Int. Cl.[4] B21F *45/00*; H02K *3/04*
U.S. Cl. 140—92.1 **18 Claims**

1. A method for winding coil winding wire in a flat coil winding comprising:

providing a coil form bobbin in the configuration of a flat disk formed with a plurality of peripheral radial slots comprising at least one set of an odd number of slots spaced around the periphery of the flat disk dividing the bobbin into a respective set of an odd number of segments, said slots extending radially from the outside perimeter partially into the flat disk;

winding the coil winding wire down through the first slot of a first odd number set of slots and under the first segment of the respective set of odd number segments;

winding the coil winding wire up through the second slot of the first odd number set of slots and over the second segment of the respective set of odd number segments; and

generally winding the coil winding wire down through the odd number slots and under the odd number segments and up through the even number slots and over the even number segments of the first set of odd number slots and respective segments to the starting first slot completing a first turn of coil winding wire around the bobbin, seating the coil winding wire in the respective slots during winding and laying the coil winding wire flat across the respective segments; then

winding the coil winding wire up through the first slot of the first odd number set of slots and over the first segment of the respective set of odd number segments;

winding the coil winding wire down through the second slot of the first odd number set of slots and under the second segment of the respective set of odd number segments; and

generally winding the coil winding wire up through the odd number slots and over the odd number segments and down through the even number slots and under the even number segments of the first set of odd number slots and respective segments to the starting first slot completing a second turn around the bobbin, seating the coil winding wire in the slots in adjacent contact with the first turn of coil winding wire and laying the coil winding wire flat across the respective segments between said slots on alternately opposite sides of the segments of the bobbin from the first turn, said coil winding wire of the second turn passing through the slots in the opposite direction from the coil winding wire of the first turn;

continuing winding additional turns of coil winding wire around the bobbin, winding each odd number turn according to the method of winding the first turn and winding each even number turn according to the method of winding the second turn, seating and packing each turn of coil winding wire in the slots in adjacent contact with the preceding turn and laying the coil winding wire from the odd number turns next to each other side by side in flat array on the same alternating sides of the respective segments of the bobbin and laying the even nember turns next to each other side by side in flat array on alternately opposite sides of the respective segments of the bobbin from the odd number turns, completing a specified number of turns, said turns of coil winding wire crossing each other in the slots, one above the other, passing in opposite directions through the slots;

said odd number of slots being selected in number so that the turns of coil winding wire form well defined apexes at the slots of the set of odd number slots with well defined angles, said turns of coil winding wire forming conducting paths on either side of the apexes having components of radial direction in the direction of radii of the bobbin and flat coil winding for conducting radial components of current flow on either side of the apexes, said radial components of current flow defining axially directed magnetic fields at the apexes parallel to the center axis of the bobbin and flat coil winding for flux interaction of the flat coil winding with adjacent elements of a magnetic circuit;

thereby winding a multipole first phase of the flat coil winding in the form of a plurality of turns of coil winding wire in a flat array having a thickness no greater than approximately the thickness of two diameters of the coil winding wire plus the thickness of the flat disk coil form bobbin in between and in the configuration of a polygon with well defined apexes.

4,691,747

CONTROLLED DEFORMATION ALIGNMENT METHOD AND APPARATUS

Paul J. Sokolovsky, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 27, 1986, Ser. No. 844,922
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—147 **4 Claims**

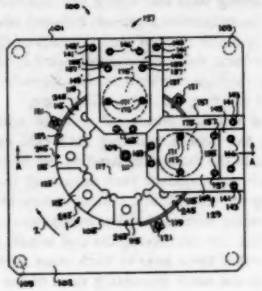
1. A method for straightening a plurality of electrical connector pins on a base of an integrated circuit mounting package, said method comprising the steps of:

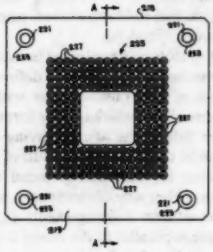
mating at a first straightening station said mounting package with a first deformation plate having first shaped apertures to deform said pins on a diagonal outward from the center of said first deformation plate into which said pins are inserted;

rotating said mounting package from the first straightening station to a second straightening station which is located orthogonally to said first straightening station; and

mating at said second straightening station said mounting package with a second deformation plate having second shaped apertures to deform said pins on a diagonal inward

to the center of said second deformation plate into which said pins are inserted, thereby aligning said pins to be





substantially perpendicular to the base of said mounting package.

4,691,748

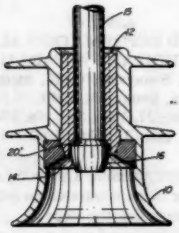
IMPROVED FILLER TUBE TIP AND CENTERING BELL BUSHING

Alfred J. Gilmour, Waterloo, Canada, assignor to Auto-Flush Systems Ltd., Waterloo, Canada

Filed Jan. 16, 1986, Ser. No. 819,278

Int. Cl.[4] B67C *3/26*

U.S. Cl. 141—165 **16 Claims**



1. In a bottle filling machine having a centering bell with a bushing for slidable movement along a vertical axis on each of a plurality of filler tubes, wherein each filler tube has an enlarged tip portion with a top shoulder for engagement with the lower end of said bushing in said bell to limit downward movement of the bell, the improvement wherein said top shoulder has a downward and outward slope of about 20° to 45° with respect to said vertical axis and wherein a region of said bushing has a downward and outward slope of about 20° to 45° with respect to said vertical axis whereby the top shoulder of said tip portion and the region of said bushing smoothly contact to reduce bouncing of the bell and increase bushing life.

4,691,749

TREE-TRUNK SAWING AND CUTTING INSTALLATION

Alfred Reuter, Oberkirch, Fed. Rep. of Germany, assignor to Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck" , Oberkirch, Fed. Rep. of Germany

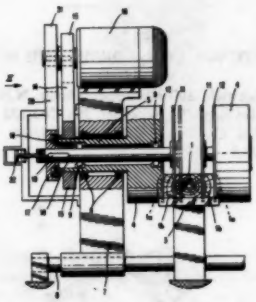
PCT No. PCT/EP85/00186, § 371 Date Dec. 30, 1985, § 102(e) Date Dec. 30, 1985, PCT Pub. No. WO85/05062, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 25, 1985, Ser. No. 822,418

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415931

Int. Cl.[4] B27C *9/00*

U.S. Cl. 144—39 **4 Claims**



1. An apparatus for the cutting and sawing of logs, said apparatus comprising:

a hollow shaft mounted for rotation about its longitudinal axis,

a knife head carried by said hollow shaft and including a first circular saw blade for the production of wood chips from logs,

a saw shaft extending coaxially through said hollow shaft and rotatable about its longitudinal axis relative to said hollow shaft, and linearly displaceable along its longitudinal axis relative to said hollow shaft, means for linearly displacing said saw shaft along its longitudinal axis,

a second circular saw blade carried by said saw shaft so as to be axially spaced from said first circular saw blade for the production of sideboards from the logs, and

drive means for rotating said hollow shaft and for rotating said saw shaft at a faster speed than said hollow shaft so that said second circular saw blade rotates faster than said first circular saw blade.

4,691,750

BARKING MACHINE

Junichi Nakajima, Shizuoka, Japan, assignor to Fuji Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 25, 1986, Ser. No. 889,923

Claims priority, application Japan, Dec. 25, 1985, 60-296587

Int. Cl.[4] B27C *9/00*

U.S. Cl. 144—208 B **8 Claims**

1. A barking machine for removing bark from logs, comprising

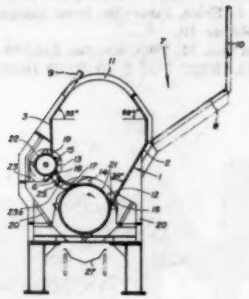
a container for receiving said logs to be debarked, having a lengthwise opening formed a lower portion and at a side portion thereof,

a transfer guide plate disposed in said opening,

a plurality of notches formed on both lengthwise sides of said opening,

a cylindrical lower rotor and a side rotor, each said rotor

having a plurality of protruding barking blades which pass through said notches, said rotors being partially inserted from the outside of said container into said opening on opposite sides of said transfer guide plate,



said lower rotor being rotated so that its barking blades move said logs toward said transfer guide plate, and

said side rotor being rotated so that said barking blades move upwardly.

4,691,751

METHOD FOR SAWING A TREE TRUNK AND FOR TREATING A UNIFORMLY THICK SLICE OF WOOD SAWED OFF THE TRUNK

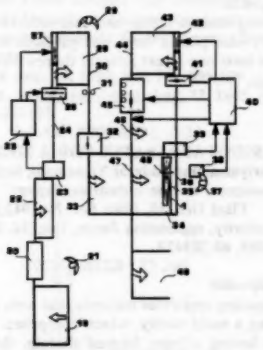
Viljo S. Komulainen, Riihimäki, Finland, assignor to Aihiko Ky, Finland

Filed Dec. 20, 1985, Ser. No. 811,641

Claims priority, application Finland, Dec. 21, 1984, 845090; Jan. 8, 1985, 850089

Int. Cl.[4] B27B *1/00*

U.S. Cl. 144—357 **10 Claims**



10. A method for treating a wood slice of a uniform thickness sawed off a tree trunk, the wood slice have a lengthwise and a cross-wise direction and having a region of varying biological quality grade, the method comprising the steps of:

(a) compiling data of product components having particular dimensions and qualities;

(b) recording the data about desired product components;

(c) observing quality attributes of regions of the wood slice;

(d) defining length-wise quality borders at locations of each wood slice, on the basis of the observed quality regions of the wood slice;

(e) recording data representing the locations of the defined quality borders;

(f) measuring the shape and size of each wood slice;

(g) recording data representing the shape and size of each wood slice measured;

(h) combining the data representing the shape and size of each wood slice with the data representing the location of the quality borders;

(i) computing the maximized value yield of the product components from said data of product components and said combined data representing shape and size of the wood slice and the location of the quality borders;

(j) fitting into each wood slice such product components as represent the maximized value yield;

(k) optimizing cross-cutting lines and sawing patterns on the basis of the product component's fit;

(l) cross-cutting and sawing the wood slice into the desired product components;

(m) and sorting the product components.

4,691,752

PNEUMATIC RADIAL TIRE

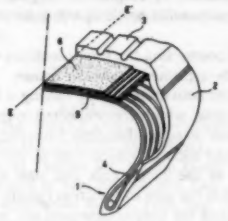
Kazuyuki Kabe, Hiratsuka, and Tuneo Morikawa, Hadano, both of Japan, assignors to Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,590

Claims priority, application Japan, Apr. 30, 1984, 59-86959

Int. Cl.[4] B60C *9/22*

U.S. Cl. 152—527 **4 Claims**



1. A pneumatic radial tire which comprises:

(1) a pair of left and right bead portions,

(2) a pair of left and right side-wall portions, continuing from the respective bead portions,

(3) a tread portion positioned between the side-wall portions,

(4) a carcass layer provided between the left and right bead portions, a cord angle of which is substantially 90 degrees in relation to the circumferential direction of the tire,

(5) an auxiliary carcass layer, a cord angle of which is substantially 0 degrees in relation to the circumferential direction of the tire, being placed on the tread side of the carcass layer substantially to correspond to the tread portion, so that the carcass layer and the auxiliary carcass layer may be crossed substantially at a right angle to form a net structure, and

(6) a belt reinforcing layer constructed from rubber reinforced with short fibers having a length of not more than 50 mm to provide a tensile rigidity, at the circumferential direction of the tire, of not less than 10-kg/mm2, said belt reinforcing layer being placed on the auxiliary carcass layer substantially to correspond to the tread portion with all belt layers in addition to said auxiliary carcass layer having a cord angle which is substantially 0 degrees in relation to the circumferential direction of the tire.

4,691,753

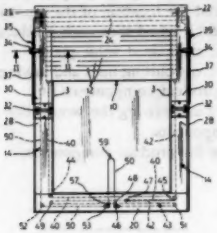
ROLL SHUTTER FOR HINGED-CASEMENT TYPE ROOF WINDOWS

Paul Baier, Reiersbacher Str. 108, D-7592 Renchen, Fed. Rep. of Germany

Continuation of Ser. No. 729,959, May 2, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 945,205

Int. Cl.[4] E06B *9/10*

U.S. Cl. 160—32 12 Claims



1. A roll shutter for a hinged casement type roof window, comprising:

a shutter frame;

a winding shaft arranged in the frame which supports a wound portion of the roll shutter plating;

two guide rails connected to the shutter frame parallel to each other, each forming a guide groove for the ends of the shutter and are divided at equal distances by the shutter frame, whereby the upper sections of the guide rails connected to the roll shutter frame are connected with the lower sections by respective hinges, the pivot axes of which run parallel to the pivot axis of the hinged casement;

a cross rail connecting the lower sections with each other at their ends opposite the shutter frame;

a roll shutter activation device having a first and a second control cable, which are connected to the lower end of the roll shutter at equal distances from the center of the roll shutter and each of which runs in one of the two guide grooves in the guide rails and past diverting elements provided in the area of the cross rail and through a bore in the frame of the hinged casement and are connected with one end of an activation loop which can be grasped by the user, a third control cable being connected to the other end of the activation loop, said third control cable passing through a bore in the frame in the hinged casement, with the winding shaft, a spool onto which the end of this third control cable is wound, said spool being fixed to the winding shaft;

wherein in the area of the cross rail, first and second loop-forming rollers are provided in addition to the diverting elements, which rollers serve to form a buffer loop, the loop length of which is at least as large as the displacement path of the roller shutter between the entirely closed and entirely opened positions, and wherein the lengths of the first and second control cables attached to the lower end of the roll shutter are selected such that their connection point, at which they are attached to each other and are connected with the third control cable running to the spool, is located within the buffer loop when the roll shutter is completely open and completely closed and;

wherein said diverting elements are located within said guide rails at opposite sides of said frame, said first and second loop-forming rollers are located at opposite sides of said frame, and said connection point is free to move within said buffer loop to any point between one of the diverting elements and the loop-forming roller located on the same side of the frame, passing over the loop-forming roller located on the opposite side of the frame, as the roll shutter is completely opened and completely closed.

4,691,754

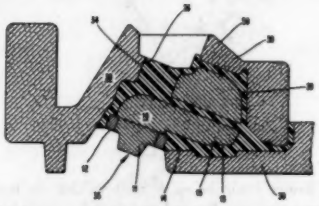
METHOD FOR FORMING CASTINGS HAVING INSERTS

David V. Trumbauer, Denver, Iowa; Larry L. Fosbinder, Moline, Ill., and Terry L. Erion, Janesville, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 31, 1985, Ser. No. 814,970

Int. Cl.[4] B22C *7/02, 9/10*; B22D *19/00*

U.S. Cl. 164—9 18 Claims



1. A core assembly useful in casting metal castings, comprising: at least one insert; a unitary destructible thermoplastic form molded-in-place at least partially about said at least one insert and supporting said at least one insert; and an outer core.

7. A method of casting metal castings including an insert comprising the steps of:

forming a composite core assembly by:

positioning in a mold cavity, which includes at least one core, at least one insert;

molding in said mold cavity a destructible form of plastic material at least partially about said at least one insert and core to form said composite core assembly wherein said at least one insert is supported by said plastic material;

inserting said composite core assembly into a second mold cavity; and

introducing molten metal into said second mold cavity to destroy said plastic form and produce a casting having said at least one insert integral therewith and at least one passage.

4,691,755

DEGASSING APPARATUS FOR A METAL MOLD

Minoru Kuriyama, and Tadashi Yamamoto, both of Yamaguchi, Japan, assignors to Ube Industries, Japan

Filed Dec. 15, 1986, Ser. No. 942,091

Claims priority, application Japan, Dec. 24, 1985, 60-289421; Dec. 24, 1985, 60-289422

Int. Cl.[4] B22D *17/20*

U.S. Cl. 164—305 16 Claims

1. A degassing apparatus incorporated with a molding apparatus having a mold cavity, which comprises:

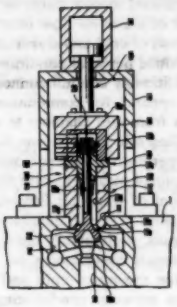
a spool having a bore formed therein, the spool further having formed therein a gas inlet opening adapted to be communicatively coupled to the mold cavity of the molding apparatus, and a gas outlet opening, the gas inlet and outlet openings being in selective communication and non-communication with each other;

means for selectively controlling the communication and non-communication between the gas inlet and gas outlet openings; and

a piston mounted in the bore and coupled to the communication controlling means, the piston being reciprocatingly slidable between a first position and a second position, the bore being further formed with first and second chamber situated on opposite axial sides of the piston;

the spool further including first, second and third fluid ports

formed therein, the first and second ports being in communication with the first and second chambers respectively; the piston further having formed therein a first channel interconnecting the first and second chamber, and a second channel interconnecting the third port and the first



chamber when the piston is in the first position, wherein the gas inlet and outlet openings are in non-communication, the third port and the first chamber being in non-communication when the piston is in the second position, wherein the gas inlet and outlet openings are in communication.

4,691,756

MOLDING MATERIAL AND MOLD

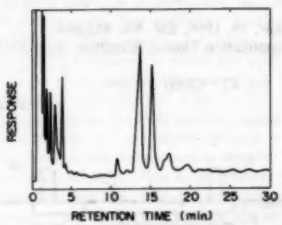
Takatoshi Suzuki; Yasuo Takada; Yuji Sakakibara; Masahiro Sugiura; Hiroaki Hayashi, and Osami Kamigaito, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Aug. 14, 1986, Ser. No. 896,199

Claims priority, application Japan, Aug. 22, 1985, 60-184550; Dec. 2, 1985, 60-271192

Int. Cl.[4] B22C *1/18, 1/22*

U.S. Cl. 164—361 **14 Claims**



1. A shell mold comprising a cavity defined by a wall or walls into which molten metal is to be poured for producing a casting, wherein at least a part of said wall or walls is formed of thermosetting resin coated castings and and hydrous magnesium silicate clay mineral, and voids are formed among grains of said resin-coated casting sand and said clay mineral, with said resin-coated casting sand and said clay mineral being bonded together, thereby minimizing generation of smoke and irritating gases at the time of casting.

4,691,757

ARRANGEMENT PROVIDED AT A CONTINUOUS CASTING PLANT

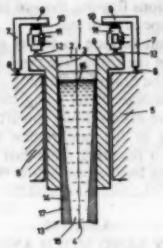
Wolfgang Polanschütz; Luzian Pochmarski, and Alfred Moser, all of Leoben, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Continuation of Ser. No. 728,301, Apr. 29, 1985, abandoned. This application Aug. 28, 1986, Ser. No. 901,995

Claims priority, application Austria, May 10, 1984, 1537/84

Int. Cl.[4] B22D *11/04*

U.S. Cl. 164—416 **10 Claims**



1. A continuous casting plant comprising a stationary supporting structure, a continous casting mold defining a mold cavity having a longitudinal axis supported on the structure, antivibration means fastened to the stationary supporting structure and an ultrasonic transducer having two ends, one end of the ultrasonic transducer being fastened to the antivibration means and the other end of the ultrasonic transducer being fastened to the continuous casting mold, thereby supporting said mold and being arranged to transmit ultrasound waves to the entire casting mold in the direction of the longitudinal axis of said mold cavity.

4,691,758

TWO-DRUM, TWO-LAYER CONTINUOUS MELD-CASTING METHOD

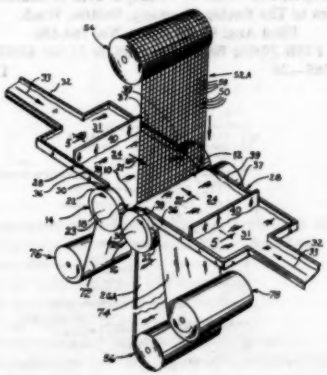
Forrest M. Palmer, 31 Towhee Rd., Hilton Head, S.C. 29928

Continuation-in-part of Ser. No. 540,834, Oct. 11, 1983, abandoned. This application May 2, 1986, Ser. No. 859,070

Claims priority, application Japan, Oct. 11, 1984, 59-213242

Int. Cl.[4] B22D *11/00, 19/14*

U.S. Cl. 164—461 **17 Claims**



1. The method of meld-casting metallic strip from molten metal comprising the steps of:

providing two closely spaced drums with parallel horizontal axes defining a bite region between them,

revolving said drums in opposite directions at approximately the same surface speed with each drum moving downwardly in the bite region,

cooling said drums for maintaining the drum surfaces below the solidification temperatures of said molten metal,

flowing the molten metal in two shallow pools at controlled velocity in each pool toward the crest of the respective drum with the level of the top surface of the flowing metal being close to the horizontal level of the crest of the drum,

the metal flows in the respective shallow pools being in opposite directions flowing toward each other toward the crest of the respective drum,

causing each drum surface to travel at least 1.5 times the flow velocity in the respective pool immediately adjacent to the crest of the drum for forming thin solidifying layers of liquidous/solidous metal being carried from the crests of the respective drums down toward the bite region, and

melding together in the bite region said two solidifying layers forming a resulting meld-cast strip moving downwardly from the bite region below the bite region.

4,691,759

BINDER FOR DRY SAND MOLD AND METHOD OF ITS USAGE

Masaru Hayakawa, Tokyo; Takeshi Yoshida, Zushi, and Atsushi Kaiya, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,010

Claims priority, application Japan, Jul. 24, 1985, 60-163711; Aug. 9, 1985, 60-175246; Aug. 9, 1985, 60-175247

Int. Cl.[4] B22C *1/22*

U.S. Cl. 164—526 **4 Claims**

1. A method for manufacturing a sand mold for castings which comprises the steps of mixing foundry sand with an aqueous solution of a binder selected from the group consisting of a hydrolyzate of a butadiene/maleic anhydride copolymer, a neutralized or a partially neutralized substance of said hydrolyzate, a modified substance prepared by modifying said hydrolyzate with a basic organic compound, or a mixture thereof so that the amount of the binder in terms of a solid content is within the range of 0.1 to 5 parts by weight based on 100 parts by weight of said foundry sand, and molding, heating, drying and thereby curing the resultant mixture.

4,691,760

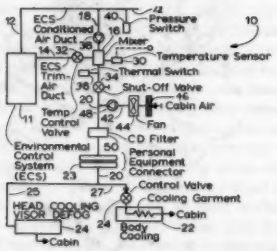
COOLING AND VISOR DEFOGGING SYSTEM FOR AN AIRCRAFT PILOT AND CREW

Alankar Gupta, and Adam J. P. Lloyd, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 9, 1985, Ser. No. 764,436

Int. Cl.[4] F25B *29/00*; B60H *1/00*; B61D *27/00*; G05D *23/00*

U.S. Cl. 165—26 **11 Claims**



1. In an aircraft having an environmental control system that produces both a flow of conditioned cold air in one duct and a flow of conditioned warm air in another duct, a thermal control system providing air conditioning to thermal control apparel worn by an aircraft pilot or crew, the system comprising:

a mixing chamber connected to both said cold and warm air ducts in a manner so as to receive flows of cold and warm air therefrom;

valve means, positioned in said warm air duct, for controlling the amount of warm air flow into said chamber, and wherein said flows of cold and warm air are mixed in said chamber to produce personal conditioning air;

a personal air conditioning conduit connecting said chamber and said flight apparel, for communicating said personal conditioning air from said chamber to said apparel;

means for controlling said valve means, including means for sensing the temperature of said personal conditioning air, wherein said control means operate said valve means to adjust the amount of warm air flowing into said mixing chamber in response to signals generated by said temperature sensing means, such signals indicating the temperature of said personal conditioning air, with such adjustment varying the mixing of cold and warm air in said chamber so that personal conditioning air is communicated to said flight apparel at a preselected comfortable temperature;

a thermal switch, positioned in said personal air conditioning conduit, said switch also sensing the temperature of said personal conditioning air;

shut-off valve means, positioned in said conduit downstream of said thermal switch, for blocking communication of said personal conditioning air from said mixing chamber to said apparel, said shut-off valve means being operated by said thermal switch to block said flow when said switch senses conditioning air temperature that is above a preselected maximum temperature;

means for sensing the pressure of said conditioned cold air; and

means for supplying aircraft cabin air to said flight apparel, said cabin air supply means being responsive to said pressure sensing means in a manner so that cabin air is supplied to said apparel when the pressure of said cold air drops below a certain preselected pressure value, said cabin air supply means being connected to said personal air conditioning conduit in a manner so that cabin air is delivered into said conduit at a position downstream of said shut-off valve means.

4,691,761

HEAT EXCHANGER

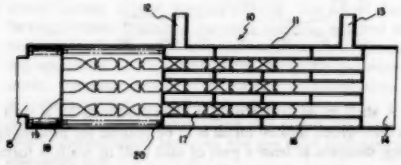
Masahiro Kito, Brighton, and Katsuhiro Mori, Hove, both of England, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 18, 1986, Ser. No. 853,694

Claims priority, application United Kingdom, Apr. 20, 1985, 8510138

Int. Cl.[4] G05D *23/00*

U.S. Cl. 165—32 **4 Claims**



1. A heat exchanger, comprising:

a casing having a first inlet port and first outlet port for a first fluid and a second inlet port and second outlet port for a second fluid;

a plurality of tubes fixedly connected to said casing;

movable turbulence generating means comprising turbu-

lence promoters movably mounted within each of said tubes and between said inlet and outlet ports;

means for detecting a temperature within said second outlet port; and

means within said second outlet port for biasing said turbulence promoters towards said second inlet port in response to a detection of increased temperature in said second outlet port by said detecting means, whereby an area of said turbulence promoters in said tubes is increased and a turbulence effect on flow of said second fluid is changed.

4,691,762

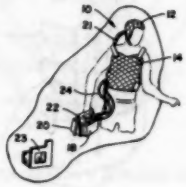
PERSONAL TEMPERATURE CONTROL SYSTEM

William Elkins, San Jose; Eugene W. Connell, Los Gatos, and Robert E. Short, Cupertino, all of Calif., assignors to Life Support Systems, Inc., Mountain View, Calif.

Continuation of Ser. No. 514,771, Apr. 1, 1983, abandoned. This application Mar. 14, 1986, Ser. No. 839,737

Int. Cl.[4] A61F *7/00*

U.S. Cl. 165—46 **12 Claims**



1. A temperature control system for the human body, adapted to be carried on the body of the user comprising:

a first heat exchanger in the form of a garment including a helmet and a separate body vest adapted to be worn by a user and connected together by a fluid conduit, each of the helmet and the body vest including a body of heat conducting material with an elongated fluid-tight passageway, adapted to conduct heat away from the head and torso of the user when worn thereon in heat-conducting relationship;

a second heat exchanger having means for receiving a source of cooling and including a body of heat conducting material with an elongated fluid-tight passageway, positioned to be in heat-conducting relationship with the source of cooling and being portable and having means for supporting it on the human body;

a first coolant conduit loop within which the first heat exchanger garment is positioned, including outlet conduit means from the heat exchanger garment and inlet conduit means to the heat exchanger garment and a bypass conduit extending between the outlet and inlet conduit means, the helmet being positioned upstream of the vest in the first heat exchange garment, whereby the coolant entering the garment from the inlet conduit means is first directed to the helmet and circulates through a series of channels throughout the helmet and is thereby warmed somewhat by heat exchange in the helmet before passing through the vest, so that the temperature differential between the coolant and the human body is less in the vest than in the helmet;

a pump in the first conduit loop, in one of said outlet conduit means and said inlet conduit means and between the heat exchanger garment and the bypass conduit, positioned to pump coolant liquid through the first heat exchanger garment from the inlet conduit means to the outlet conduit means;

a coolant liquid reservoir having an inlet and an outlet positioned in the first coolant conduit loop and containing coolant liquid;

a second coolant conduit loop within which the second heat exchanger is positioned, including said bypass conduit as part of the second conduit loop;

quick-disconnect means for joining the second heat exchanger into the second conduit loop whereby the second heat exchanger may be easily removed from the loop and replaced by another heat exchanger;

adjustable flow valve means connected in the bypass conduit, for adjusting the proportion of liquid coolant flowing from the outlet conduit means through (a) the second coolant conduit loop and (b) the bypass conduit, such valve being adjustable so that all, none or any proportion of the liquid coolant may be directed through the bypass conduit with the remainder, if any, being directed through the second coolant conduit loop, whereby the setting of the adjustable flow valve means regulates the extent to which coolant liquid warmed in the first heat exchanger garment is cooled in the second heat exchanger for return to the heat exchanger garment, and

portability means for securing the liquid reservoir, the pump, the bypass conduit and the adjustable flow valve means on the body of the user whereby the system is easily carried by the user for movement through hostile, high-temperature environments.

4,691,763

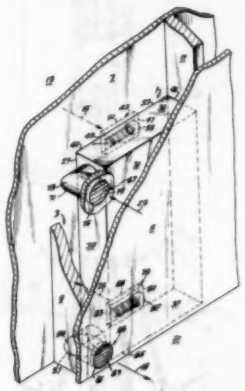
VENTILATOR INCLUDING A DOUBLE PASS COUNTERCURRENT HEAT EXCHANGER

Michael Kennedy, Yonkers, N.Y., assignor to Brother Albert Welsh Foundation, New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,791

Int. Cl.[4] F24H *3/02*

U.S. Cl. 165—54 **14 Claims**



1. A ventilator for replacing stale air with fresh air, and for exchanging heat between the stale air replaced and the fresh air, the ventilator comprising:

a fresh air inlet for receiving fresh air;

a fresh air outlet for exhausting fresh air;

a stale air inlet for receiving stale air;

a stale air outlet for exhausting stale air; and

a heat exchanger for exchanging heat between the stale air and fresh air;

wherein the fresh air inlet and outlet and the stale air inlet and outlet each include duct means for coupling the respective inlets and outlets to the heat exchanger such that

fresh air entering and exiting the exchanger is segregated from stale air entering and exiting the exchanger and wherein the exchanger includes conduit means connected to the duct means for establishing a continuous fresh air channel and a continuous stale air channel, the fresh air channel being pneumatically isolated from the stale air channel, and heat transfer means for exchanging heat between air in the fresh air channel and air in the stale air channel, the fresh air channel and the stale air channel being wound one upon the other and upon at least a portion or a ventilator inlet duct means associated with one channel and at least a portion of a ventilator outlet duct means associated with the other channel such that air in the fresh air channel flows in a direction countercurrent to the direction of air flowing in the stale air channel over a majority of the stale air channel length, and such that air in the fresh air channel passes in heat exchange relation to the stale air channel twice.

4,691,764

HEAT EXCHANGER UNIT WITH SUPPORT RING AND RADIAL BRACKETS

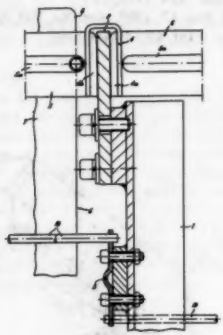
Felix Dürst, Zürich, Switzerland, assignor to Norbert Allenspach, Switzerland

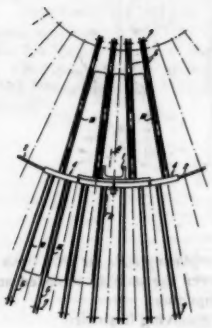
Filed Mar. 13, 1986, Ser. No. 839,357

Claims priority, application Switzerland, Mar. 15, 1985, 1167/85

Int. Cl.[4] F28F *9/00*

U.S. Cl. 165—68 **5 Claims**





1. A heat exchanger, comprising a support, a plurality of stays mounted at spaced locations on said support, a horizontal bracket secured to each of said stays, a plurality of connected heat exchanger plates having at least one plate with an upper end suspended from said bracket, said plates having heat media carrying channels which are joined together, said brackets project out at intervals from one another from at least one side of said support and lying in a horizontal plane, said heat exchanger comprises a cylindrical tower structure, said support comprising a cylindrical steel ring having a radius, said brackets projecting radially outwardly and inwardly at regular intervals from one another, each of said brackets having a radial length and each of said heat exchanger plates having a radial edge extending along the bracket to which it is connected, the lengths being longer than the edges but shorter than the radius of said steel ring forming said support.

4,691,765

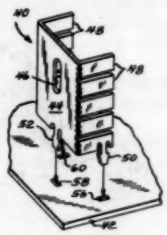
HEAT SINK

George Wozniczka, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 31, 1986, Ser. No. 846,664

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—80.3 **9 Claims**



1. A heat sink positioned on a PC board for removing and dissipating heat in the PC board, said PC board having a plurality of spaced elongated apertures therein, said heat sink comprising:

a heat conducting body comprised of a plurality of generally planar members coupled along respective adjacent lateral edges thereof so as to form a unitary, multi-section structure having a generally continuous, flat edge portion thereon; and

a plurality of mounting tabs each attached to a respective planar member of said multi-section heat conducting body along the flat edge portion thereof and adapted for insertion within a respective PC board aperture, each of said mounting tabs having an elongated proximal portion and a distal end portion wider than the proximal portion of said mounting tab, wherein said distal end portion includes beveled cam means adapted for engaging an edge of the PC board aperture within which said mounting tab is inserted when said distal end portion is rotationally displaced about said elongated proximal portion resulting in the twisting thereof and for displacing said heat conducting body toward the PC board whereupon the PC board is positioned in intimate contact with the flat edge portion of said heat conducting body along the length thereof.

4,691,766

FINNED TUBE ARRANGEMENT FOR HEAT EXCHANGERS

Dieter Wurz, Riefstahlstrasse 6, 7500 - Karlsruhe, and Paul Palkert, Brunsbergweg 5a, 5810 Witten, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 630,244, Jul. 12, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,160

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325876

Int. Cl.[4] F28F *13/00, 13/12, 1/10*; F24B *1/06*

U.S. Cl. 165—135 **4 Claims**

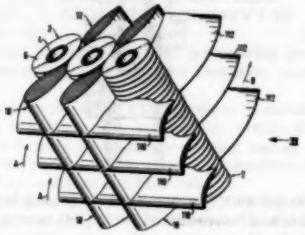
1. In a finned tube heat exchanger assembly including a plurality of parallel tubes each having a plurality of longitudi-

nally-spaced, radially-extending annular fins mounted concentrically thereon, thereby to afford heat transfer between a first fluid medium flowing through the tubes and a second medium flowing externally thereof,

the improvement which comprises

(a) a plurality of first flow guide members arranged parallel to said finned tubes and in the inflow and outflow paths of said second fluid medium with respect to said finned tubes; and

(b) a plurality of second flow guide members arranged transversely of said finned tubes and said first flow guide members in the inflow and outflow paths of said second medium with respect to said finned tubes, said first and second flow guide members arranged in the inflow path defining generally a lattice for directing said second medium across said tubes in a direction normal to the axes thereof;



(c) said first flow guide members each having a symmetrical streamlined configuration relative to a center plane extending in the lengthwise direction thereof and each of said second flow guide members having an airfoil configuration including a first portion of maximum thickness and a second blade portion of minimum thickness arranged on opposite sides of said tubes, said first and second portions being curved to provide each of said second flow guide members with a generally S-shaped configuration, whereby when said second medium is directed toward said second flow guide member first portions, said second medium is directed by said first portions across said tubes in a direction normal to the axis thereof and by said portions to an outlet.

4,691,767

HEAT EXCHANGER

Hiroyoshi Tanaka, Kyoto; Masaaki Adachi, Nara; Yoshiyuki Tsuda, Suita; Shigeo Aoyama, Higashiosaka; Satoshi Tanno, and Kaoru Kato, both of Ohtsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Refrigeration Company, both of Osaka, Japan

Filed Sep. 4, 1985, Ser. No. 772,748

Claims priority, application Japan, Sep. 4, 1984, 59-185948; Jan. 25, 1985, 60-12993; Mar. 6, 1985, 60-44068

Int. Cl.[4] F28D *1/04*

U.S. Cl. 165—151 **20 Claims**

1. A heat exchanger comprising:

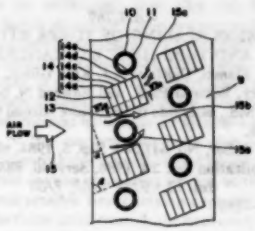
a plurality of flat plate fins arranged parallel to one another at predetermined intervals so as to allow an air stream to flow therebetween, each fin having a leading edge arranged perpendicularly to the air flow; and

a plurality of heat transfer tubes passing through the fins;

each of said fins being provided with a number of groups of successively adjacent first air vents arranged to cross the wake side of the air stream;

each of said first air vents being defined by a first slat having four sides in which two sides, facing the air stream, are opened and the other two sides are provided with leg portions for connecting said first slat with said fin, and

said leg portions in each group of first air vents being aligned with each other and being inclined at a same angle with respect to a line along said fin and normal to said leading edge of said fin such that all of the portion of the air



stream passing through each group of first air vents is deflected from the direction of flow thereof upon entering said group normal to said leading edge.

4,691,768

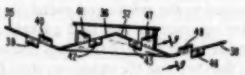
LANCED FIN CONDENSER FOR CENTRAL AIR CONDITIONER

Charles B. Obosu, Nashville, Tenn., assignor to Heil-Quaker Corporation, Lavergne, Tenn.

Filed Dec. 27, 1985, Ser. No. 813,863

Int. Cl.[4] F28D *1/04*

U.S. Cl. 165—151 **9 Claims**



1. In a finned-tube heat exchanger unit, wherein heat transfer takes place between a first fluid flowing through a plurality of spaced-apart finned tubes and a second fluid flowing outside the finned tubes, a fin comprising:

a thin sheet of a heat conductive material formed into first corrugations of predetermined pitch and height and also formed to have apertures therein spaced at intervals and having substantially cylindrical collars around such apertures of a shape and size to closely fit around said heat exchanger tubes for conductive heat exchange therewith, at least one edge of said sheet formed into second corrugations; and

said fin being shaped around said collar in the form of a shallow conical annular zone that is peripherally faired into said corrugated shape and is inclined with respect to

a plane normal to the axis of said cylindrical collar at an angle of approximately 6°.

4,691,769

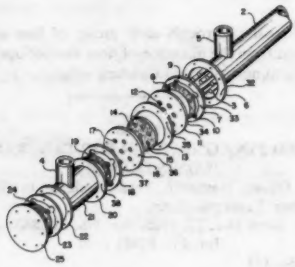
COMPRESSION SEALING OF TUBES WITHIN SHELL AND TUBE HEAT EXCHANGER

Katherine K. Flamm, Baltimore; J. Kyle Gilley, Columbia; David F. Geary, Severna Park, and Edward N. Schinner, Highland, all of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Continuation of Ser. No. 647,584, Sep. 5, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,477

Int. Cl.[4] F28F *9/02, 7/00*

U.S. Cl. 165—158 **13 Claims**



1. A shell and tube heat exchanger sealing means comprising a shell and an extension shell for sealing the tubes within the shell so that fluid flowing from the extension shell into the tubes within the shell is separated from the fluid flowing within the shell, which comprises a shell flange and an extension shell flange, two incompressible tube sheets and a tube sheet gasket with holes therethrough for the tubes, a relatively incompressible tube sheet gasket retainer in circumferential arrangement around the tube sheet gasket and two flange gaskets each with a circumferentially arranged flange gasket retainer adjacent to the shell and extension shell flanges, wherein said flange gaskets include protrusions along an outer circumference thereof and said flange gasket retainers include complementary indentations along an inner circumference thereof, wherein the tube sheet gasket and flange gaskets are thicker than the respective tube sheet gasket retainer and flange gasket retainers so as to compress and radially expand the flange gaskets an amount limited to the radial inner dimension of the flange gasket retainers and compress and radially expand the tube sheet gasket an amount limited to the width and radial inner dimension of the sheet gasket retainer so that said gaskets effectively seal the tubes from the inner shell of the shell and tube heat exchanger and to seal the shell and the extension shell from each other and from the atmosphere upon the application of a compressive force applied by tightening bolts extending through holes radially external to the shell in the shell flange and extension shell flange.

4,691,770

WELL CASING PACKER

Roderick D. McLeod, 5104 125th Street, Edmonton, Alberta, Canada T6H 3V5

Filed Dec. 27, 1985, Ser. No. 813,927

Claims priority, application Canada, Apr. 3, 1985, 478275

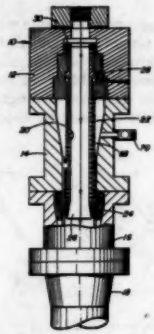
Int. Cl.[4] F21B *33/04*

U.S. Cl. 166—73 **3 Claims**

1. A short-coupled well casing packer comprises a body adapted for external mounting on a casing head, tubing spool or the like;

concentric inner and outer mandrels supported in said body, said outer mandrel being adapted to be restrained to the casing head and said inner mandrel being movable axially with respect to said outer mandrel;

high pressure seal means on the lower end of said outer mandrel for circumferentially sealing against the inner wall of the casing; means on the lower of end of said inner mandrel for engaging and expanding said seal means;



hydraulic pressure responsive means in said body and secured to said inner mandrel for linearly moving said inner mandrel with respect to said outer mandrel;

and means for locking said inner mandrel in position relative to said outer mandrel.

4,691,771

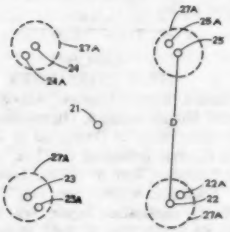
RECOVERY OF OIL BY IN-SITU COMBUSTION FOLLOWED BY IN-SITU HYDROGENATION

Charles H. Ware, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to WorldEnergy Systems, Inc., Fort Worth, Tex.

Continuation of Ser. No. 653,905, Sep. 25, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 908,885

Int. Cl.[4] E21B *43/243, 43/30*

U.S. Cl. 166—245 **6 Claims**



1. A method of recovering petroleum from an underground formation, comprising the steps of:

by way of a first well penetrating said formation, injecting at least oxygen into said formation and subjecting the petroleum in said formation surrounding said first well to in-situ combustion to heat said formation in a zone surrounding said well,

terminating the injection of oxygen into said formation,

injecting hydrogen into said heated formation zone by way of said first well,

by way of a second well, penetrating said formation and spaced from said first well, injecting into said formation, fluid to drive fluids including petroleum, in said formation between said second well and a third well, to said third well,

said third well being located near said first well such that said third well penetrates said heated formation zone,

said petroleum in said formation between said second well said third well being driven through said heated formation zone surrounding said third well and in the presence of hydrogen, hydrogenation of said petroleum occurs, and

by way of said third well, recovering petroleum driven to said third well.

4,691,772

PROCESS FOR OBTAINING PERMEABILITY LOGS USING RADIOACTIVE DRILLING MUD ADDITIVES

Ben W. Ebenhack, Fullerton, and Robert J. Floran, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 22, 1985, Ser. No. 725,398

Int. Cl.[4] E21B *47/04, 49/00*; G01V *5/00*

U.S. Cl. 166—254 **21 Claims**

1. A method for determining the permeability profile of a borehole penetrating a subterranean formation, said method comprising:

a. drilling a borehole into a subterranean formation using a drilling mud containing substantially evenly distributed particles bearing a gamma ray emitting nuclide so that a substantial portion of the particles accumulates along the face of the wellbore in a filter cake;

b. making a gamma spectroscopic log of the borehole bearing the substantially intact filter cake while the formation is being drilled; and

c. determining the permeability profile of the subterranean formation from the log of the borehole bearing the filter cake.

4,691,773

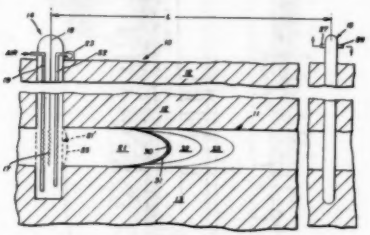
INSITU WET COMBUSTION PROCESS FOR RECOVERY OF HEAVY OILS

George D. Ward, Washington, and Charles E. Ward, West Redding, both of Conn., assignors to Ward Douglas & Co. Inc., Washington Depot, Conn.

Continuation-in-part of Ser. No. 657,723, Oct. 4, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,359

Int. Cl.[4] E21B *43/24, 43/243*

U.S. Cl. 166—261 **15 Claims**



1. In the process for the recovery of petroliferous products from a subterranean formation containing said products by insitu wet combustion, the improvement comprising first, initiating the conventional wet combustion process in the usual manner by injecting an oxygen containing stream into said formation through an injection well, obtaining ignition of the petroliferous material in the formation by use of an igniter or other means, initiating the addition of liquid water to said oxygen containing stream being injected into said formation through said injection well, and collecting the gases produced and liquid products from one or more surrounding production wells, and then:

(a) introducing, after combustion has been initiated, in a first stage operation into said formation upstream of the flame front an initial amount of fluids containing oxygen in which the concentration of free uncombined molecular oxygen is controlled, by adjusting the amount of said liquid water stream added to said oxygen containing stream, to be sufficiently high that the flame is not quenched below its ignition temperature and a significant hot zone is established upstream of the flame front having a desired operating temperature range, and

(b) subsequently, in a second stage operation, introducing in said formation upstream of said flame front fluids containing free uncombined molecular oxygen in which the concentration of free uncombined molecular oxygen is reduced, by adjusting the amount of said liquid water stream added to said oxygen containing stream, to the point such that the total sensible heat carrying capacity of the fluids entering the flame zone exceeds the heat carrying capacity of a first portion of the formation entering the flame zone at the velocity of movement of said flame front, thereby producing a substantial increase in the temperature of a second portion of said formation downstream of said flame front and creating a downstream hot zone downstream of said flame front in which substantial amounts of petroliferous products are cracked.

2. In the process for the recovery of petroliferous products from a subterranean formation containing said products by insitu wet combustion, the improvement comprising first, initiating the conventional wet combustion process in the usual manner by injecting an oxygen containing stream into said formation through an injection well, obtaining ignition of the petroliferous material in the formation by use of an igniter or other means, initiating the addition of steam to said oxygen containing stream being injected into said formation through said injection well, and collecting the gases produced and liquid products from one or more surrounding production wells, and then:

(a) introducing, after combustion has been initiated, in a first stage operation into said formation upstream of the flame front an initial amount of fluids containing oxygen in which the concentration of free uncombined molecular oxygen is controlled, by adjusting the amount of said steam added to said oxygen containing stream, to be sufficiently high that the flame is not quenched below its ignition temperature and a significant hot zone is established upstream of the flame front having a desired operating temperature range, and

(b) subsequently, in a second stage operation, introducing in said formation upstream of said flame front fluids containing free uncombined molecular oxygen in which the concentration of free uncombined molecular oxygen is reduced, by adjusting the amount of said steam added to said oxygen containing stream, to the point such that the total sensible heat carrying capacity of the fluids entering the flame zone exceeds the heat carrying capacity of a first portion of the formation extering the flame zone at the velocity of movement of said flame front, thereby producing a substantial increase in the temperature of a second portion of said formation downstream of said flame front and creating a downstream hot zone downstream of said flame front in which substantial amounts of petroliferous products are cracked.

4,691,774

NOVEL FERROFLUIDS FOR USE IN CEMENTING WELLS

Erik B. Nelson, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Nov. 15, 1985, Ser. No. 798,527

Int. Cl.[4] E21B *33/16*

U.S. Cl. 166—291 **3 Claims**

1. A method of preparing a well for cementing comprising:

(a) injecting into the annulus separating a casing and the formation a stable ferrofluid comprising an aqueous spacer or wash containing finely divided magnetic particles, and

a binding agent or surfactant in an amount sufficient to render the composition stable in a magnetic field, and

(b) applying a magnetic field to cause a mechanical response of said ferrofluid in the annulus.

3. A method of cementing a well comprising the steps of:

(a) injecting a stable ferrofluid into the annulus separating a casing and a subterranean formation wherein said ferrofluid comprises an aqueous spacer or wash containing finely divided magnetic particles and a binding agent or surfactant in an amount sufficient to render the composition stable in a magnetic field, and,

(b) applying a magnetic field to cause a mechanical response of said stable ferrofluid in the annulus, and

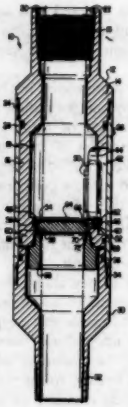
(c) displacing said stable ferrofluid with a stable cementitious ferrofluid comprising: (i) a hydraulic cement, (ii) finely divided magnetic particles, (iii) a binding agent or a surfactant, and (iv) a liquid medium, said binding agent or surfactant being present in an amount sufficient to render the composition stable in a magnetic field.

4,691,775

ISOLATION VALVE WITH FRANGIBLE FLAPPER ELEMENT

Lee M. Lustig, Garland, and Gary D. Ellis, Richardson, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 25, 1986, Ser. No. 843,910
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—317 **8 Claims**



1. An isolation valve comprising:

(a) a tubular member;

(b) a flapper mounted for pivotal movement within the tubular member between a closed and an open position;

(c) the flapper including a frangible member disposed for reopening when the flapper is in the sealing position.

4,691,776

RETRIEVABLE WELL SAFETY VALVE WITH EXPANDABLE EXTERNAL SEALS

Ronald E. Pringle, Houston, Tex., assignor to Cameo, Incorporated, Houston, Tex.

Filed May 29, 1986, Ser. No. 868,916
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—319 **7 Claims**

1. A retrievable subsurface well safety valve for controlling fluid flow through a well conduit having a polished bore comprising,

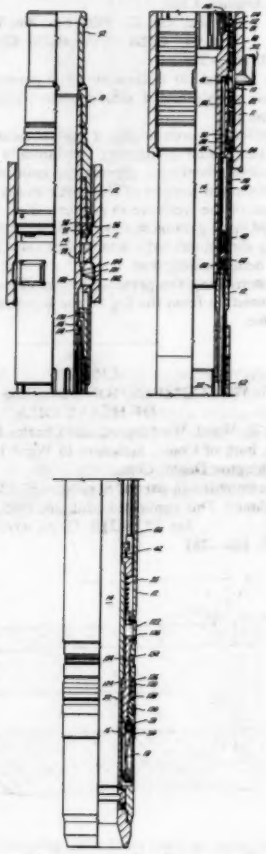
a tubular housing having a fluid control port and having a bore and having a valve closure member moving between open and closed positions for controlling the fluid flow through the bore,

a flow tube telescopically moving in the housing for controlling the movement of the valve closure member,

biasing means for moving the flow tube in a direction to close the valve,

piston and cylinder assembly means in the housing, said assembly engaging the flow tube and said assembly exposed to the fluid port for receiving control fluid for actuating the assembly and flow tube,

external means supported by the housing for sealing in the polished bore of the well conduit, said seal means including a first seal having a first and second end, the first end



abutting the housing for preventing movement of the first end, a longitudinally movable piston abutting the second end of the first seal, said first seal initially having an outer periphery of a size less than the size of the inner periphery of the polished bore and less than the maximum outside diameter of the housing, said seal means including a second seal connected to the piston for moving the piston against the first seal for expanding the first seal into engagement with the polished bore, said second seal sized to form an interference fit with the polished bore for actuating the piston upon the application of fluid pressure on the second seal,

means for holding the first seal means in an expanded position,

an additional external seal means on the exterior of the housing on each side of the fluid control port,

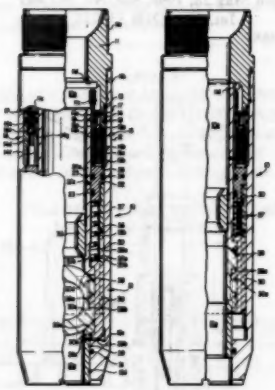
each additional seal means including a third seal having a first and second end, the first end of the third seal abutting the housing for preventing movement of the first end, a longitudinally movable piston abutting the second end of the third seal, said third seal initially having an outer periphery of a size less than the size of the inner periphery of the polished bore and less than the outside diameter of the housing, and including a fourth seal connected to the piston and exposed to the port for moving the piston against the third seal for expanding the third seal into engagement with the polished bore, said fourth deal sized to form an interference fit with the polished bore for actuating the piston upon application of fluid pressure to the port, and means for holding the third seal in an expanded position.

4,691,777

STANDING AND INJECTION VALVE

Jimmie R. Williamson, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 7, 1986, Ser. No. 849,125
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—319 **11 Claims**



1. A standing valve comprising:

(a) a housing having a longitudinal flow passage therethrough and at least one lateral port in the housing wall communicating between said flow passage and the valve exterior;

(b) annular valve means in said housing for controlling flow through said lateral port;

(c) first operator means for operating said annular valve means between open and closed positions;

(d) second operator means for moving said annular valve means to open position permitting two-way flow between the valve exterior and said housing flow passage through said lateral port; and

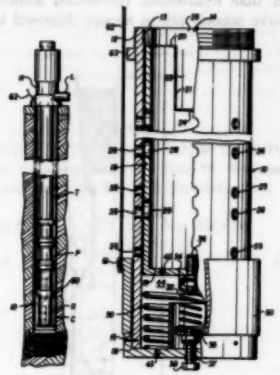
(e) control means for controlling pressure required to operate said second operator means.

4,691,778

DOWNHOLE WATER FLOW CONTROLLER FOR AQUIFER STORAGE RECOVERY WELLS

R. David G. Pyne, 540 NE. 5th Ave., Gainesville, Fla. 32601

Filed Feb. 9, 1987, Ser. No. 13,078
Int. Cl.[4] E21B *34/08*
U.S. Cl. 166—320 **21 Claims**



1. A downhole flow control device for continuous automatic control of water flowing into or out of wells, aquifers and the like through pipe columns including pump columns and injection pipes so as to prevent cascading during recharging comprising a first tubular member having upper and lower ends and side walls, said upper end of said first tubular member being mounted to the pipe column so as to be in fluid communication therewith, said lower end of said first tubular member being substantially closed, a second tubular member mounted concentrically within and proximate to said first tubular member and having an open upper end and side walls and a substantially closed lower end, a plurality of first and second openings through said side walls of said first tubular member, said first openings being spaced in vertical relationship to said second openings, a plurality of third openings through said second tubular member, said second tubular member being vertically movable with respect to said first tubular member so as to selectively align said third openings with either of said first and second openings, biasing means located between said lower ends of said first and second tubular members for normally urging said second tubular member vertically upward with respect to said first tubular member, said biasing means being yieldable upon the introduction of water into the pump column to permit said second tubular member to be vertically displaced relative to said first tubular member to thereby close said third openings with respect to said first or second openings and thereafter permitting said third openings to align with one of said first and second openings dependent upon the direction of fluid flow within the pipe column.

4,691,779

HYDROSTATIC REFERENCED SAFETY-CIRCULATING VALVE

Michael E. McMahan; Daniel A. Newman; Donald W. Winslow, all of Duncan, and Gary D. Zunkel, Chickasha, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 17, 1986, Ser. No. 820,289
Int. Cl.[4] E21B *34/08*
U.S. Cl. 166—321 **65 Claims**

1. An annulus pressure responsive downhole tool apparatus, comprising:

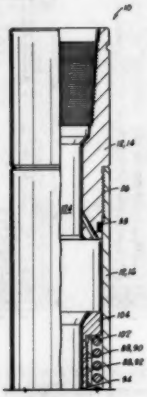
a housing;

an operation element means disposed in said housing and

movable from a first element position to a second element position relative to said housing;

a hydrostatic pressure referenced, pressure balanced with respective to hydrostatic pressure, annulus pressure responsive first piston means disposed in said housing, said first piston means being movable from a first to a second position thereof relative to said housing in response to an increase in well annulus pressure;

a lower than hydrostatic referenced annulus pressure responsive second piston means, disposed in said housing



and operatively associated with said operating element means, for permitting said operating element means to move from said first element position to said second element position in response to movement of said second piston means from a first position toward a second position thereof relative to said housing; and

a prevention means, operatively associated with said first and second piston means, for preventing said seconds piston means from moving to its said second position until said first piston means has moved at least part way toward its said second position.

4,691,780

SUBSEA WELLHEAD STRUCTURE

Edward M. Galle, Jr.; Kevin Gendron, and Paul C. Berner, Jr., all of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

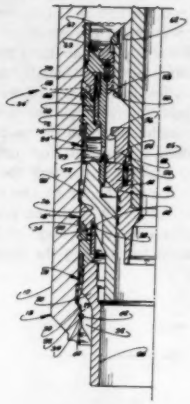
Filed Jun. 3, 1985, Ser. No. 740,523
Int. Cl.[4] E21B *43/01*
U.S. Cl. 166—348 **17 Claims**

1. A subsea wellhead structure comprising

a casing hanger having an exterior downwardly facing shoulder, a central bore, an upper internal threaded surface and an upper exterior surface tapered downwardly and outwardly,

a seal assembly including a metal seal sleeve having downwardly extending fingers, and an intermediate sealing portion including an internal annular bulbous metal sealing surface and an external cylindrical metal sealing surface,

means for latching said sealing assembly in set position,



a protector sleeve, and

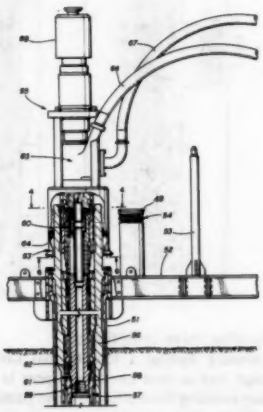
means releasably securing said protector sleeve to said seal assembly and said latching means.

4,691,781

WELL DRILLING AND COMPLETION APPARATUS

John C. Gano, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 28, 1986, Ser. No. 867,499
Int. Cl.[4] E21B *33/035*
U.S. Cl. 166—368 **7 Claims**



1. A wellhead comprising:

casing head means in said wellhead;

tubular hanger means supported in said casing head means;

cooperative seal means between said casing head means and said tubing hanger means, and hold-down means between said casing head means and said tubing hanger means;

said cooperative seal means and hold-down means permitting tilting of said tubing hanger means relative to said casing head means while maintaining said tubing hanger means in its supported position in said casing head means

and said seal means in sealing relationship with said casing head means and said tubing hanger means; and

wellhead connector means releasably secured to said tubing hanger means.

4,691,782

METHODS FOR IMPACT AND VIBRATION DAMPING AND ARTICLES THEREFOR

Clifford R. Stine, Setauket, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 564,218, Dec. 22, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,190

Int. Cl.[4] **A01L** *7/02;* **A43B** *13/12, 13/40;* **F16M** *13/00*

U.S. Cl. 168—12 **18 Claims**

1. A method for dynamic force damping including the steps of

(a) affixing to one object a pad comprising a material having the damping, energy absorption, dimensional stability and liquid absorption characteristics of an elastoplastic blend including:

(1) 25–50 parts of a first polymer prepared from a monomer selected from the group consisting of olefin, substituted olefin, and unsaturated vinyl acetate monomers, and

(2) 25–80 parts of conjugated diene butyl rubbery material;

(b) subjecting the object to impact or vibrating force relative to a second object whereby significant energy is dissipated as heat in the pad.

18. In combination,

(a) a horseshoe,

(b) a pad comprising a blend of 30–70 parts polyolefin and 25–60 parts conjugated diene butyl rubbery material said pad being essentially moisture non absorbent, dimensionally stable and capable of dynamic shock damping by converting a measurable amount of shock impact energy into heat, and

(c) means to permit affixing said horseshoe to a horse with said pad disposed therebetween.

4,691,783

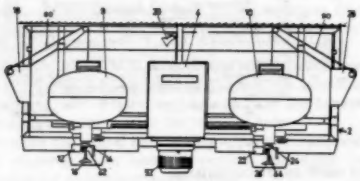
AUTOMATIC MODULAR FIRE EXTINGUISHER SYSTEM FOR COMPUTER ROOMS

Geoffrey S. Stern, New York, N.Y. Israel; Zion Avni, Kfar Saba, Israel; Amos Gonen, Herziliya, Israel, and Amiram Peleg, Beit Yehoshua, Israel, assignors to Spectronix Ltd., Tel-Aviv, Israel

Filed Mar. 6, 1986, Ser. No. 836,682

Int. Cl.[4] **A62C** *35/02, 37/04*

U.S. Cl. 169—61 **13 Claims**



1. A module for use in a fire extinguishing system and comprising:

a housing, having a bottom panel;

detector means extending through a first hole in said bottom panel to just below the plane of said bottom panel, for detecting characteristics of a fire or an incipient fire;

control means adapted to be actuated by detection at said detector means;

fire extinguishing means adapted to be discharged by said control means, said fire extinguishing means comprising at least one container filled with extinguishing agent and terminated by a discharge valve, and a nozzle connected to said discharge valve, said nozzle comprising a deflector, extending through a second hole in said bottom panel distinct from said first hole and ending just below said bottom panel so that said bottom panel acts as a shield against turbulence; and;

a winch assembly, comprising a pulley and pulley line, connected to the top of said at least one container for lowering said at least one container.

4,691,784

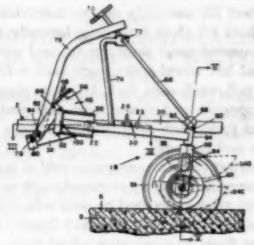
LAWN EDGER ATTACHMENT FOR TRACTORS

David L. Mullet, Sarasota, Fla., and Ivan W. Bontrager, Hesston, Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Sep. 2, 1986, Ser. No. 902,516

Int. Cl.[4] **A01D** *34/84*

U.S. Cl. 172—15 **12 Claims**



1. A lawn edger attachment for a tractor comprising:

a. a base member,

b. means for attaching said base member rigidly but removably to the frame of said tractor,

c. an elongated boom normally extending laterally outwardly from said tractor at an acute angle to the direction of travel of the tractor,

d. a universally pivotal connection joining the inner end of said boom to said base member,

e. a circular, generally planar cutting blade disposed beneath the extended end of said boom in a generally vertical plane, being mounted on said boom both for rotation about its own axis and for rotation about a generally vertical axis relative to said boom,

f. a manual operating lever connected to said boom and extending to a position accessible to the operator of the tractor, said lever being operable by forward and rearward movement thereof to pivot said boom on the horizontal axis of said universal pivotal connection, and by lateral movement thereof to pivot said boom on the vertical axis of said universal connection, said horizontal and vertical axes of said universal connection being offset relatively to each other in a direction longitudinal to said boom, whereby said boom may be pivoted about said horizontal axis to lift said boom and said blade with less manual force applied to said operating lever than would be required if said horizontal and vertical axes were both disposed at the same longitudinal point of said boom,

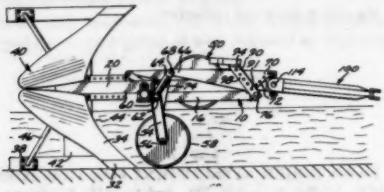
g. manually operable means for turning said blade on its vertical axis relative to said boom, and

h. manually operable means for pivoting said boom on the horizontal axis of said universal connection to press said blade into penetrating relation to the ground.

4,691,785
REVERSIBLE PLOW AND CARRIAGE

Charles R. Post, Midway City, Calif., assignor to Post Brothers Construction Co., Orange, Calif.

Filed Mar. 18, 1985, Ser. No. 712,881
Int. Cl.[4] A01B *63/16, 3/30*
U.S. Cl. 172—212 **20 Claims**



1. In a carriage having at least one support wheel mounted on each of its left and right sides with wheel lift assembly means for a controlled, variable elevational position of each wheel, the improvement comprising:

(a) a carriage frame having at least one longitudinal member and front and rear cross members;

(b) said wheel lift assembly means comprising a main axle and a wheel lift shaft extending laterally across, and secured at spaced-apart positions to, said carriage frame;

(c) right and left wheel forks, each with a fork knuckle on one thereof, each said fork knuckle pivotally received over an opposite end of said main axle, and said right and left wheel forks each distally supporting a wheel axle on the other end thereof;

(d) right and left wheels comprising said at least one support wheel, one each rotatably received on its respective one of said wheel axles supported by said wheel forks;

(e) right and left fork arms, one each fixedly secured to and projecting from its respective wheel fork;

(f) right and left wheel lift levers pivotally mounted on said lift shaft at opposite ends thereof, and each having a first plurality of spaced-apart apertures;

(g) right and left lift links, one each distally and pivotally attached to its respective one of said fork arms and extending to its respective one of said lift levers and having a second, like plurality of apertures at equal spaced-apart intervals to said first plurality of apertures whereby respective pairs of apertures of said first and second pluralities of apertures are aligned in at least one position of said wheel lift assembly means;

(h) right and left removable pin means, one each inserted in a preselected, aligned pair of said apertures; and

(i) means to rotate said lift shaft whereby said lift assembly means displaces said right and left wheels a controlled vertical distance as determined by the insertion of its respective one of said pin means in a preselected aligned pair of said apertures.

4,691,786
BOLT-NUT TIGHTENING DEVICE HAVING MEANS FOR PREVENTING ABNORMAL ROTATION

Masahiro Fujita, Sennan, and Yukio Uemura, Yokohama, both of Japan, assignors to Maeda Metal Industries Ltd., Osaka and Nissan Motor Co., Ltd., Kanagawa, both of, Japan

Continuation of Ser. No. 624,174, Jun. 25, 1984, abandoned.
This application Jun. 27, 1986, Ser. No. 879,520
Claims priority, application Japan, Jun. 30, 1983, 58-102303[U]
Int. Cl.[4] B23Q *5/00*
U.S. Cl. 173—12 **4 Claims**

1. A device for securing a fastener with a nut, said fastener having a head, a threaded shank and a sheer-off tip of polygonal cross section, said device comprising;

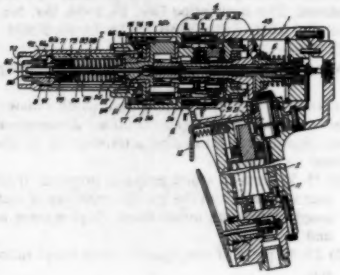
(a) a housing;

(b) a motor controlled by a switch means;

(c) an epicyclic gear train in said housing and including a tubular internal gear case, a sun gear driven by said motor and a planet gear support frame having planet gears in constant mesh with said sun gear and said tubular internal gear case;

(d) means between said tubular gear case and said housing for preventing the rotation of said tubular internal gear case in the nut loosening one direction;

(e) an outer nut engaging socket connected to and driven by



said tubular gear case in a direction for tightening said nut on said threaded shank; and

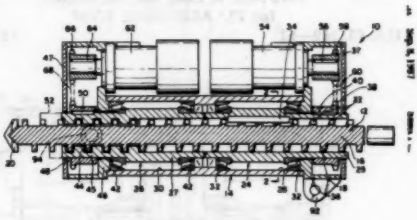
(f) an inner tip engaging socket connected to the planet gear support frame and driven in a direction opposite to the direction of said outer nut engaging socket;

wherein said means between said tubular gear case and said housing for preventing the rotation of said tubular internal gear case in said nut loosening one direction prevents abnormal rotation of the tubular internal gear case integrally together with and in the same direction as the inner socket.

4,691,787
EARTH AUGER

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,842
Int. Cl.[4] B23Q *5/33*
U.S. Cl. 173—145 **6 Claims**



1. An earth auger comprising:

a drilling screw for cutting into and excavating earth, having a shaft portion, a blade portion formed spirally around said shaft portion, a bit portion secured to one end of said shaft portion and having substantially the same diameter as said blade portion, and notches arranged axially linearly on said blade portion;

a case for the screw;

a first rotary member supported rotatably about said shaft portion in the case to surround partially said screw and having a key engaging said notches of said screw;

a second rotary member disposed coaxially with said first rotary member and supported rotatably about said shaft

portion in said case and having a thread groove meshing with said blade of said screw; and

drive mechanisms for rotating said first rotary member to rotate said screw and said second rotary member to move said screw along the longitudinal axis of the shaft portion.

4,691,788

LATERAL HOLE BORING METHOD AND APPARATUS

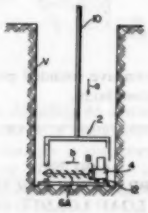
Shoji Yoshida, Funabashi; Yasuhiko Haru; Etsuji Kosaka, both of Yokohama; Toshimichi Ikeda, Ibaraki; Mikio Aoyama, Matsudo, and Takeo Iida, Tokyo, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd. and Tokyo Gas Co., Ltd., both of Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,735

Claims priority, application Japan, Jul. 4, 1984, 59-137094; Jul. 4, 1984, 59-137095; Jul. 4, 1984, 59-137096; Jul. 4, 1984, 59-137097; Jul. 4, 1984, 59-100010[U]

Int. Cl.[4] E21B *7/00*

U.S. Cl. 175—62 **17 Claims**



1. A method of boring a lateral hole underground the method comprising the steps of:

(a) preparing a vertical hole of a desired depth extending from a surface of the ground into the earth;

(b) preparing a lateral hole boring apparatus, a leading sugar of a length smaller than a diameter of the vertical hole, and a plurality of coupling augers each of a length smaller than the diameter of the vertical hole;

(c) attaching the leading auger to the lateral hole boring apparatus outside said vertical hole;

(d) lowering the lateral hole boring apparatus equipped with the leading auger into the vertical hole and stopping the apparatus in a desired position in the vertical hole;

(e) manipulating said lateral hole boring apparatus from the ground level to drive and advance said leading auger to bore a lateral hole;

(f) stopping the driving and advancing of the leading auger when the lateral hole has reached a predetermined length commensurate with the length of the leading auger;

(g) manipulating the lateral hole boring aparatus from the ground level to detach the leading auger from lateral hole boring apparatus;

(h) lifting the lateral hole boring apparatus above the vertical hole while leaving the leading auger in the lateral hole;

(i) attaching one of the coupling augers to the lateral hole boring apparatus outside the vertical hole;

(j) lowering the lateral hole boring apparatus equipped with the coupling auger into the vertical hole again until it reaches the predetermined position;

(k) manipulating the lateral hole boring apparatus from the ground level to connect to the coupling auger to the leading auger left behind in the lateral hole;

(l) repeating the steps (e) to (k) until the lateral hole has reached a predetermined final length.

(m) manipulating the the lateral hole boring apparatus from the ground level, after the lateral hole of the predetermined final length has been formed, to rearwardly move the leading auger and all coupling augers disposed in the lateral hole a distance corresponding to a length of one coupling auger;

(n) manipulating the lateral hole boring apparatus from the ground level to detach the extremity trailing auger of the rearwardly moved augers from the rest of the augers;

(o) lifting the lateral hole boring apparatus equipped with the extremity trailing auger above the vertical hole while leaving the rest of the augers in the lateral hole;

(p) detaching the extremity trailing auger from the lateral hole boring apparatus outside the vertical hole;

(q) again lowering the lateral hole boring apparatus into the vertical hole until the hole boring apparatus reaches the predetermined position;

(r) manipulating the lateral hole boring apparatus from the ground level to make the lateral hole boring apparatus grasp the next trailing auger remaining in the lateral hole;

(s) and repeating the steps (m)–(r) until all the augers including the leading auger have been withdrawn from the lateral hole and returned to the ground level.

4,691,789

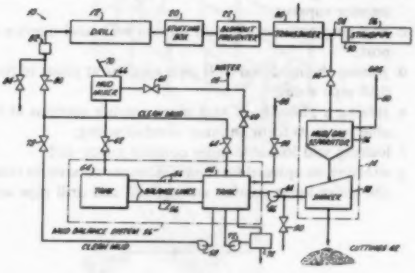
PROCESS FOR ESTABLISHING A CLEAR HORIZONTAL BOREHOLE IN A SUBTERRANEAN FORMATION

Walter L. Richards, Huntington Beach, Calif.; Roger L. Henderson, Bluefield, W. Va.; George N. Aul, Richlands, Va., and Barry W. Pauley, West Blocton, Ala., assignors to Methane Drainage Ventures, Placentia, Calif.

Filed Jun. 9, 1986, Ser. No. 871,903

Int. Cl.[4] E21B *7/20*; E21D *10/00*

U.S. Cl. 175—62 **16 Claims**



1. A process for establishing a clear, generally horizontal borehole path in a subterranean formation having sloughing or caving characteristics, said process comprising the steps of:

drilling a generally horizontal borehole into a subterranean formation having sloughing or caving characteristics using a drill bit and drill pipe;

lubricating the drill bit and drill pipe with a mud capable of forming a cake on the borehole walls;

withdrawing the drill bit and drill pipe and thereafter replacing the drill bit with a casing shoe, said cake maintaining borehole wall integrity while the drill pipe is removed from the borehole;

inserting the casing shoe and drill pipe into the borehole;

simultaneously inserting a liner into the generally horizontal borehole inside of the drill pipe; and,

removing the drill pipe and casing shoe while holding the liner within the borehole, said casing shoe passing on the outside of said liner as it is removed, said liner providing a clean path through the borehole.

4,691,790

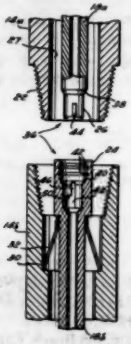
METHOD AND APPARATUS FOR REMOVING THE INNER CONDUIT FROM A DUAL PASSAGE DRILL STRING

James M. Reichman, Issaquah; Michael C. McDonald, Summer, both of Wash., and T. B. O'Brien, Midland, Tex., assignors to Flowdril Corporation, Kent, Wash.

Continuation-in-part of Ser. No. 661,368, Oct. 16, 1984, Pat. No. 4,624,327. This application Mar. 5, 1985, Ser. No. 708,245

Int. Cl.[4] E21B *7/18, 17/18;* **F16L** *17/00*

U.S. Cl. 175—67 **19 Claims**



1. A method for removing the inner conduit from a dual conduit drill string used in drilling holes for geothermal, oil, and gas wells, and the like, to permit use of emergency or salvage procedures, comprising:

a. providing a standard drill pipe section;

b. modifying said standard drill pipe section to form an interior support;

c. engaging an inner conduit section with said interior support;

d. joining the modified drill pipe sections at joints to form a drill pipe string;

e. joining a plurality of said inner conduit sections at lockable joints to form an inner conduit string;

f. locking said lockable inner conduit joints; and

g. exerting an upward force on said inner conduit to remove the entire inner conduit string from said drill pipe string.

4,691,791

KNURLED DRILL STEM

Pierre R. Fillet, Paris, France, assignor to Vallourec, Paris, France

Filed Aug. 16, 1984, Ser. No. 641,562

Claims priority, application France, Aug. 17, 1983, 83 13379

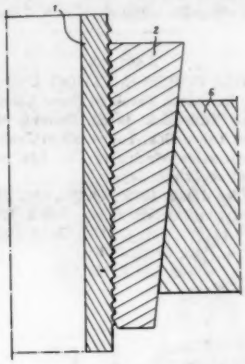
Int. Cl.[4] E21B *17/00, 19/10;* **F16B** *2/12*

U.S. Cl. 175—320 **8 Claims**

1. A device for holding a drill stem for use in sinking shafts in the ground comprising:

a drill stem body having on its periphery a surface of revolution with a generatrix comprising a succession of contiguous concave rounded profiles with a substantially toric shape, an upper end of said concave rounded profiles being extended with a substantially flat conical surface and an under end of said concave rounded profiles being extended with a substantially conical surface; and

a self gripping slip means adapted to hold said drill stem, said slip means having a surface of revolution with a generatrix comprising a succession of contiguous convex rounded profiles having a shape complementary to the shape of



said contiguous concave rounded profiles on the periphery of said drill stem body.

4,691,792

METHOD AND APPARATUS FOR MEASURING NET WEIGHT OF LOAD LOADED ON VEHICLE

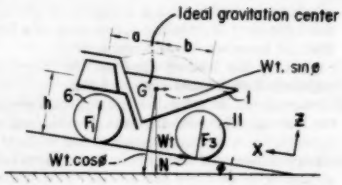
Fumio Shintani, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

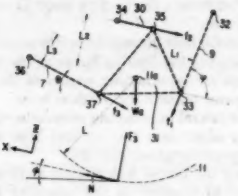
Filed Jul. 23, 1985, Ser. No. 757,979

Claims priority, application Japan, Jul. 27, 1984, 59-155200

Int. Cl.[4] G01G *19/10, 5/04;* **G06F** *15/20*

U.S. Cl. 177—1 **5 Claims**





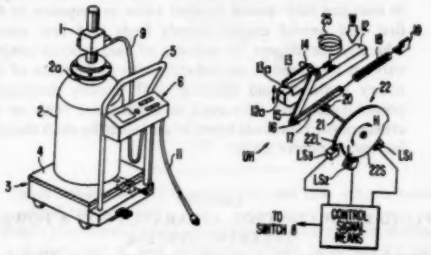
1. A method for measuring the net weight of the load on a vehicle, which comprises the steps of detecting the axial force applied to each of suspension cylinders mounted between the vehicle body and axles on which wheels are journaled, and then compensating the detected axial force in accordance with respective mounting angles of links of linkage mechanisms mounted in the periphery of the axle, respectively, and the inclination angle of the vehicle body.

4,691,793

APPARATUS FOR DETECTING AMOUNT OF LIQUID NITROGEN

Koichi Kumakura, and Yoshinori Hosokawa, both of Minami, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 13, 1985, Ser. No. 809,111
Claims priority, application Japan, Dec. 13, 1984, 59-189233
Int. Cl.[4] G01G *19/52, 3/14, 19/00*
U.S. Cl. 177—50 2 Claims



1. An apparatus for detecting an amount of liquid nitrogen and shutting off power to a semiconductor radio detector when the amount of nitrogen is low, comprising:

a table for supporting a Dewar vessel in which liquid nitrogen used for cooling a semiconductor radio detector is contained;

a motion conversion mechanism engaged with said table for converting the movement of the table in the up and down direction in response to changes in the weight of the liquid nitrogen in the vessel and amplifying the movement, said motion conversion mechanism including a disk rotated by the amplified motion of said table;

a plurality of sensors adjacent said disk for detecting the rotational position of said disk which is representative of the weight of the liquid nitrogen in the vessel;

a signal controlled switch connected in the power supply for the semiconductor radio detector; and

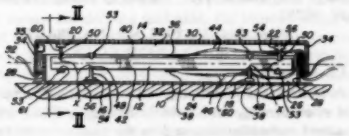
control signal means connected between said sensors and said switch for supplying a control signal to turn said switch off when said sensors sense that the weight of liquid nitrogen in said vessel is below a predetermined amount.

4,691,794

WEIGHT SCALES AND STRAIN GAUGE ASSEMBLIES USEABLE THEREIN

Larry D. Larsen, Elgin, Ill.; Richard C. S. Yung; Wing K. Leung, both of Hong Kong, Hong Kong, and Joseph E. Hogel, Algonquin, Ill., assignors to Fyrnetics, Inc., Elgin, Ill.

PCT No. PCT/US83/01617, § 371 Date Sep. 4, 1984, § 102(e) Date Sep. 4, 1984, PCT Pub. No. WO85/01796, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 19, 1983, Ser. No. 689,377
Int. Cl.[4] G01G *3/14, 21/24*
U.S. Cl. 177—211 62 Claims



1. In a weight scale having a housing and a display responsive to a strain gauge signal for visually indicating weight measured by the scale, an improved strain gauge assembly, comprising:

a flexible member with a strain gauge attached thereto to provide an electrical signal in response to the flexing of the flexible member;

a foot member in underlying relationship with the flexible member;

a load receiving member in overlying relationship with the flexible member;

a pair of support members connected with the foot member for supporting the flexible member at a pair of spaced locations associated therewith; and

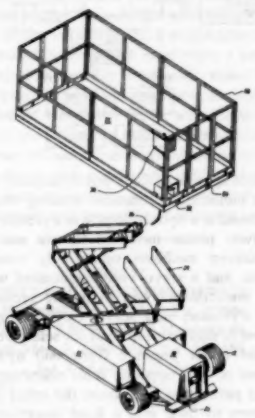
a pair of load transmitting members connected with the load receiving member for transmitting a load therefrom to the flexible member at two locations spaced from one another and from the pair of locations associated with the foot member, at least one of said support members and load transmitting members having one end pivotally connected to the flexible member to pivot at a fixed location thereof and another end connected to the associated one of the foot member and load receiving member for relative lateral movement with respect thereto.

4,691,795

VEHICLE FLUIDIC DRIVE CIRCUIT

Donald T. Wehmeyer, Woodinville, Wash., and Ronald W. Barnhart, Elmhurst, Ill., assignors to Economy Engineering, Inc., Bensenville, Ill.

Continuation-in-part of Ser. No. 279,934, Jul. 2, 1981, abandoned, and Ser. No. 467,908, Feb. 18, 1983, abandoned. This application Jun. 18, 1985, Ser. No. 746,786
Int. Cl.[4] B62D *11/04;* F16D *65/24*
U.S. Cl. 180—6.48 3 Claims



1. In a fluid powered vehicle, a fluid power system for controlling driving torque to a drive wheel of the vehicle comprising:

a fluid pressure driven motor mounted in driving engagement with the driving wheel of said vehicle;

a restricting orifice mounted proximate said fluid pressure driven motor within the fluidic circuit directing power thereto, for providing constant but limited flow of fluid to said pressure driven motor;

a control valve mounted within said fluidic circuit proximate said fluid pressure driven motor in said fluidic circuit and providing, with respect to said restricting orifice, a parallel path to said fluid pressure driven motor for said fluid pressure; and

a pressure sensing line connected between said control valve and the inlet to said fluid pressure driven motor and ar-

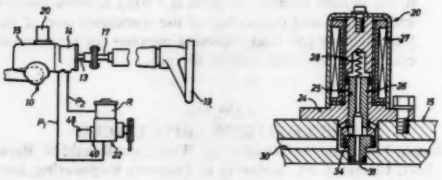
ranged to maintain said control valve open while the pressure at the inlet to said fluid pressure driven motor remains above a predetermined pressure and to close said control valve when the pressure at the inlet to said fluid pressure driven motor falls below a predetermined pressure.

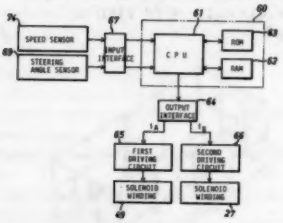
4,691,796

CONTROL APPARATUS FOR POWER-ASSISTED STEERING SYSTEM

Shigeo Tanooka; Yutaka Mori; Akihiro Oono, all of Kariya, and Akira Hasegawa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 6, 1985, Ser. No. 773,233
Claims priority, application Japan, Sep. 10, 1984, 59-190423
Int. Cl.[4] B62D 5/08
U.S. Cl. 180—142 **3 Claims**





1. A control apparatus for a power-assisted steering system in a vehicle including a rotatable steering shaft, a source of hydraulic pressure, a hydraulic power cylinder having a reciprocating power piston mounted therein and opposite fluid chambers, driven members operatively connected to said power piston, and a servo valve associated with said power cylinder to interconnect said hydraulic pressure source and said power cylinder, said servo valve being responsive to rotary motion of said steering shaft for selectively directing the flow of fluid under pressure from said hydraulic pressure source to one of said opposite fluid chambers of said power cylinder and permitting fluid from the other of said opposite fluid chambers to flow into a fluid reservoir thus effecting reciprocating movement of said power piston, said control apparatus comprising:

a first sensor for detecting rotary motion of said steering shaft and for producing a first output signal indicative of a rotary angle of said steering shaft and a second output signal indicative of a rotational speed of said steering shaft;

a second sensor for detecting a speed of the vehicle and for producing a third output signal indicative of the vehicle speed;

a first electrically operated control valve arranged to control a quantity of fluid under pressure discharged from said hydraulic pressure source;

a second electrically operated control valve of the normally closed type disposed within a bypass passage between the opposite fluid chambers of said power cylinder, whereby when said second control valve is in an energized condition fluid can flow therethrough thereby providing bypass flow; and

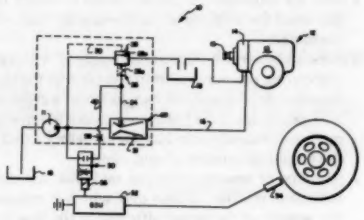
an electric control apparatus arranged to energize said first control valve in response only to said second and third output signals from said first and second sensors whereby the quantity of said fluid under pressure supplied into said power cylinder from said hydraulic pressure source is decreased in accordance with an increase of the vehicle speed and increased in accordance with an increase of the rotational speed of said steering shaft and being arranged to energize said second control valve in response to the first and second output signals from said first sensor whereby the degree of opening of said second control valve is increased in accordance with an increase of the rotary angle of said steering shaft thereby decreasing power assist, and decreased in accordance with an increase of the rotational speed of said steering shaft thereby increasing power assist.

4,691,797

FLUID FLOW CONTROL APPARATUS FOR A POWER STEERING SYSTEM

Laurence L. Miller, W. Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 10, 1986, Ser. No. 883,931
Int. Cl.[4] B62D 5/08
U.S. Cl. 180—143 **8 Claims**



1. An apparatus for controlling fluid flow from a hydraulic pump to a hydraulic power steering mechanism, said apparatus comprising:

orifice means, through which fluid from the pump flows to the steering mechanism, for generating a hydraulic control signal proportional to the fluid flow rate through said orifice means;

flow control valve means for bypassing fluid flow away from the steering mechanism in response to said hydraulic control signal; and

control means for modifying said hydraulic control signal including a pilot fluid circuit between the pump and said orifice means and a solenoid operated valve means in said pilot fluid circuit and operable in response to a secondary control signal.

4,691,798

SYSTEM FOR AUTOMATICALLY PREVENTING TURNOVER OF TWO WHEELED VEHICLES

Thomas S. Engelbach, 1037 Monterey Blvd., Hermosa Beach, Calif. 90254

Filed Oct. 10, 1985, Ser. No. 786,078
Int. Cl.[4] B62D 61/12
U.S. Cl. 180—209 **22 Claims**

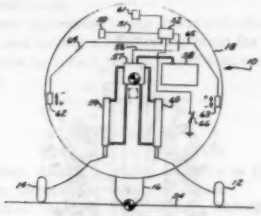
1. A system for stabilizing a two wheeled vehicle against lateral overturning, said vehicle having a front wheel and a rear wheel normally disposed in the same vertical plane, said stabilizing system comprising:

a pair of outrigger wheels pivoting on the vehicle frame for vertical movement relative thereto and disposed respec-

tively at opposite sides of said rear wheel in laterally outwardly spaced relation therefrom;

means for sensing the roll rate of said vehicle and generating a first electrical signal in response thereto;

mean responsive to said electrical signal for generating a second electrical signal if the rate of roll is greater than the



limit achievable while said front and rear wheels retain lateral traction; and

means responsive to said second electrical signal for moving at least one of said outrigger wheels downwardly into engagement with the roadway surface whereby the vehicle is enabled to return to a stable position.

4,691,799

DRIVE ARRANGEMENT FOR THREE WHEELED VEHICLES

Hiromitsu Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

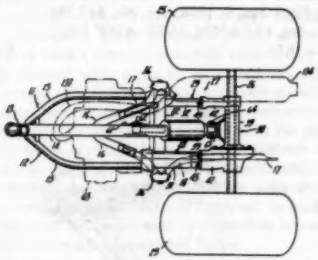
Division of Ser. No. 475,838, Mar. 16, 1983, Pat. No. 4,540,061. This application Jun. 12, 1985, Ser. No. 744,024

Claims priority, application Japan, Mar. 29, 1982, 57-50387; Nov. 19, 1982, 57-203188

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] B62D *61/06*

U.S. Cl. 180—215 **5 Claims**



1. In a vehicle or the like comprising frame means, at least one front wheel dirigibly supported by said frame means, trailing arm means comprising a pair of spaced apart members pivotally supported on said frame means at one end of said spaced apart members, an axle supported for rotation at the other end of said trailing arm means, a pair of rear wheels affixed for rotation with said axle, and power means carried by said frame means for driving said axle, the improvement comprising said trailing arm means including tube means extending between said spaced apart members and at least partially enclosing said axle, a pair of spaced apart bearing means for journaling said axle on opposite sides of its point of drive at the free ends of said arm members at the transverse outer edges thereof and in proximity to said rear wheels for minimizing unit loading thereupon, said trailing arm means comprises a rear housing assembly containing a final drive for driving said axle, said bearing means being carried in part by said rear housing assembly and outwardly of said final drive, a drive shaft extending through one of said trailing arm members, said housing assembly comprising a housing defining a final drive cavity for receiving a ring and pinion gear and including a cover plate affixed to said housing and covering said final drive cavity, said bearing means comprising a first bearing supported by said housing at an outer end thereof and a second bearing carried by the outer end of said cover plate.

4,691,800

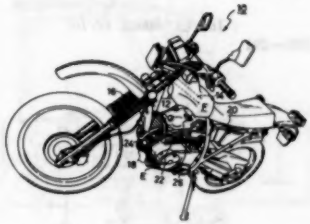
VEHICLE BODY FRAME FOR MOTORCYCLES

Kohji Kadono, Saitama, and Minoru Tsunoda, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,100

Int. Cl.[4] B62J *19/30*

U.S. Cl. 180—219 **1 Claim**



1. A vehicle body frame for a motorcycle having an engine comprising a single-tube main frame extending from a head pipe to the rear of the vehicle body, a single-tube down frame extending downwardly from said head pipe, a pair of center pillars extending downwardly from said main frame rearwardly of an engine, a pair of bottom frame members connecting the lower end of said down frame with the lower ends of said center pillars and extending under said engine and a pair of detachably connected side frame members having a forked portion at their front ends connecting with said down frame and at its rear ends connecting with said center pillars outwardly of said engine and inwardly of a rider's legs.

4,691,801

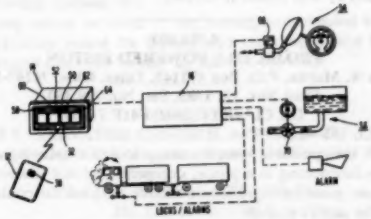
VEHICLE PROTECTION DEVICE

Yale Mann, 1135 Rydal Rd., Rydal, Pa. 19046, and Pekka Sarssi, Heteniitantie 5 B 10, 00960 Helsinki 96, Finland

Filed Mar. 3, 1986, Ser. No. 835,465

Int. Cl.[4] B60R *25/10*

U.S. Cl. 180—287 **4 Claims**



1. A vehicle anti-theft device for a truck having a parking brake system, said device comprising:

(a) locking means for preventing operation of said truck;

(b) a portable, battery operated infrared light transmitter

comprising a manual switch for selectively activating emission of a; predetermined stream of light pulses and

(c) a control unit, operable only after engagement of said parking brake system, said control unit comprising an infrared detector for receiving said stream of light pulses, a demodulator for converting said stream of light pulses to a digital data stream, and a microprocessor which compares said digital data stream to a digital identification code stored in a read only memory, said microprocessor enabling activation/deactivation of said locking means for preventing operation of said truck whenever said digital data stream is identical to said digital identification code.

4,691,802

AGRICULTURAL TRACTOR

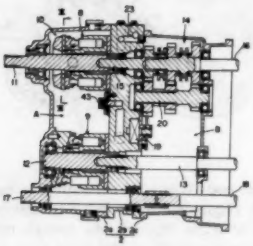
Shoso Ishimori; Seiichi Ishiizumi, and Mikio Ishida, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jun. 28, 1985, Ser. No. 750,105

Claims priority, application Japan, Jul. 10, 1984, 59-104657[U]; Jul. 17, 1984, 59-108703[U]; Jul. 17, 1984, 59-148958

Int. Cl.[4] **B60K** *17/10*

U.S. Cl. 180—291 **7 Claims**



1. An agricultural tractor comprising:

a front transmission case portion (*2a*),

hydraulic stepless change speed means (**10**) housed in the front transmission case portion (*2a*),

a rear transmission case portion (*2c*),

gearing means (**14**) housed in the rear transmission case portion (*2c*),

a partition wall portion (*2b*) disposed between and interconnecting the front and rear transmission case portions (*2a*, *2c*), the partition wall portion (*2b*) having passages defining the sole oil passages (**21,23**) for actuating said hydraulic stepless change speed means (**10**), said partition wall portion (*2b*) having an exterior wall exposed to the ambiance, and

a tractor frame (**3**) carrying an engine (**1**) and fixedly connected to said exterior wall of said partition wall portion (*2b*) by bolt means (**24,25,26**).

4,691,803

PROJECTILE POWERED PISTON

Philip N. Martin, P.O. Box 471143, Tulsa, Okla. 74147-1143

Filed Nov. 18, 1985, Ser. No. 799,350

Int. Cl.[4] **G01V** *1/04;* **F41F** *17/06*

U.S. Cl. 181—113 **5 Claims**

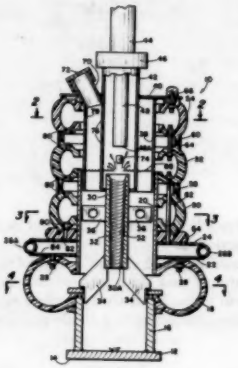
1. A transportable seismic energy source employing a projectile functioning as a piston, comprising:

a base plate having a lower surface adapted for contacting the earth's surface;

a master cylinder affixed at its lower end to said base plate and extending uprightly therefrom;

a receiving cylinder of outside diameter less than the internal diameter of said master cylinder and supported coaxially within the upper portion of said master cylinder, the master cylinder and receiving cylinder being filled with liquid;

a slug firing gun mounted to said master cylinder, the gun having a muzzle extending coaxially and above said receiving cylinder, the lower end of the muzzle being above the liquid level in said master and said receiving cylinder, the internal diameter of said receiving cylinder being



greater than the maximum diameter of a slug as distorted upon impact with liquid in said receiving cylinder whereby a slug will pass downwardly through the interior of said receiving cylinder and enter said master cylinder; and

means to vent blast gas from said gun muzzle to the exterior of said master cylinder.

4,691,804

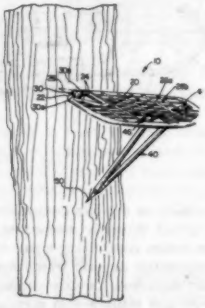
PORTABLE TREE SEAT AND PLATFORM FOR STANDING

Robert L. Bunker, 429 Crows Mill Rd., Fords, N.J. 08863

Filed Jan. 9, 1986, Ser. No. 817,295

Int. Cl.[4] **A01M** *31/02;* **A45F** *3/26*

U.S. Cl. 182—187 **4 Claims**



1. A portable seat comprising:

a seat member having top and bottom surfaces;

a screw threaded fastening member pivotally mounted on the front end of said seat member for threaded penetration of a post or tree to which said portable seat is adapted to be attached, the base of said screw member adjacent to said seat member being enlarged to form a spherical stop member which bears against the tree or post as the screw member is threaded into the post or tree and which limits the penetration of the screw member into the post or tree

and provides stability to the seat member and prevents lateral movement with respect to the tree or post;

said seat member including a supporting framework having a storge compartment for receipt of said screw threaded fastening member when not in use;

a V-shaped stabilizing member pivotally attached at its wide end to said seat member for preventing pivoting of said seat member; and

a peg member connected to the lower end of said V-shaped member and having a penetrating point for penetrating a post or tree to which said portable seat is adapted to be attached.

4,691,805

LIFTING APPARATUS

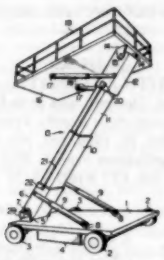
Mitsuihiro Kishi, Ashikaga, Japan, assignor to Kabushiki Kaisha Hikoma Seisakucho, Ashikaga, Japan

Filed Mar. 28, 1986, Ser. No. 845,687

Claims priority, application Japan, Mar. 28, 1985, 60-064803; Jul. 26, 1985, 60-166577; Sep. 19, 1985, 60-207155; Sep. 19, 1985, 60-207156

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 R **29 Claims**



1. A lifting apparatus comprising:

(a) a mobile vehicle;

(b) a platform disposed over said mobile vehicle;

(c) a stretchable boom pivotally joined at the lower end thereof with a pin to said mobile vehicle and at the upper end thereof with a pin to said platform, for raising or lowering said platofrm relative to said mobile vehicle;

said stretchable boom comprising a lowermost boom pivotally joined to said mobile vehicle with the pin, an uppermost boom pivotally joined to said platform with the pin, and a plurality of intermediate booms slidably inserted one in another in a telescopic fashion with the lowermost intermediate boom slidably inserted in said lowermost boom and said uppermost intermediate boom inserted in and fixed to said uppermost boom;

(d) an extension detecting unit for detecting the existing length, of said stretchable boom represented by the center distance between the pin pivotally joining the stretchable boom to said mobile vehicle and the pin pivotally joining said stretchable boom to said platform;

(e) an inclination detector for detecting the existing inclination of said stretchable boom;

(f) a hydraulic control system comprising a control circuit and a hydraulic circuit;

said control circuit being capable of controlling the operation of the hydraulic circuit on the basis of the detection signals given thereto from said extension detecting unit and said inclination detector so that said platform is raised or lowered vertically with respect to and directly above said mobile vehicle and so that said platform is always held in parallel to the upper surface of the deck of said mobile vehicle; and

(g) a power unit including a hydraulic pump for supplying the pressurized working fluid to said hydraulic circuit, and driving means for driving said hydaulic pump, and mounted on said mobile vehicle.

4,691,806

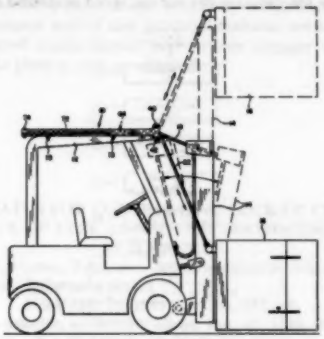
APPARATUS FOR TAKING UP AND PLAYING OUT LINES

Norman A. Jansen, 18965 S. Pear Rd., Oregon City, Oreg. 97045, and Beryl D. Randall, 4025 NE. 109th Ave., Portland, Oreg. 97220

Continuation of Ser. No. 529,952, Sep. 6, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,379

Int. Cl.[4] B66B *9/20*; A62C *35/00*; B65H *75/34*

U.S. Cl. 187—9 R **6 Claims**



1. In a forklift vehicle, the improvement comprising in combination:

a vehicle body having a roof or overhead support members;

a movable mast mounted to the body;

an actuator mounted to the mast and operable in response to hydraulic or electrical power;

at least one elonaged flexible line, such as an electrical power line or hydraulic hose lines, coupled from the body to the actuator;

line handling attachment means mounted to the roof or overhead support members so as to be above and out of the forward field of vision of an operator of the vehicle, the line handling attachment means comprising:

an elongated housing defining a line receiving opening through which at least one loop of line may be passed;

traveling means within the housing for engaging a loop of the line which is passed into the housing through the line receiving opening, said traveling means being slidable relative to the housing for movement in a first direction which plays out a length of the loop through the line receiving opening and for movement in a second direction which takes up a length of the loop through the line receiving opening; and

biasing means mounted to the housing and coupled to said traveling means for biasing said traveling means in the second direction to take up slack in the loop.

4,691,807

ELEVATOR CONTROL APPARATUS

Shigemi Iwata, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 5, 1986, Ser. No. 836,522

Int. Cl.[4] B66B *5/08*

U.S. Cl. 187—117 **7 Claims**

1. An elevator control apparatus for controlling operation of a cage in an elevator system, said elevator control apparatus conpirising:

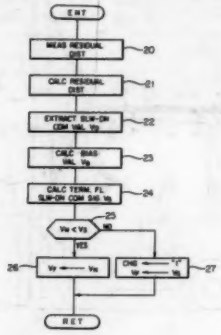
means for generating a normal speed command signal having

a normal pattern providing gradually decreasing terminal speed as the cage approaches a level of a terminal floor;

means for generating a terminal-floor slowdown signal including means for calculating a slowdown command value on the basis of actual residual distance to the level of the terminal floor and means for determining a bias value, the slowdown command value and bias value being used in generating the terminal-floor slowdown command signal and providing a normal pattern generally similar to the normal pattern of the normal speed command signal and separated therefrom by a magnitude determined by the bias value;

means for comparing the normal speed command signal and the terminal-floor slowdown command signal;

means for choosing the normal speed command signal as a



final terminal slowdown command signal for controlling terminal speed of the cage when, based on comparing the command signals, the normal speed command signal is less than the terminal-floor slowdown command signal, or

the terminal-floor slowdown command signal as the final terminal slowdown command signal for controlling terminal speed of the cage when, based on comparing the command signals, the normal speed command signal is not less than the terminal-floor slowdown command signal; and

means for correcting the terminal-floor slowdown command signal when chosen as the final terminal slowdown command signal by changing the bias value used in generating the final terminal-floor slowdown command signal;

whereby the final terminal slowdown command signal follows at least a final portion of the normal pattern of the normal speed command signal.

4,691,808

ADAPTIVE ASSIGNMENT OF ELEVATOR CAR CALLS

Frederick H. Nowak, Southington, and Isabel Hovey, Simsbury, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 17, 1986, Ser. No. 931,599
Int. Cl.[4] B66B *1/20*
U.S. Cl. 187—125 **9 Claims**

1. An elevator system comprising two or more cars servicing a plurality of floors in a building and processor means controlling the motion and door openings of the cars characterized by:

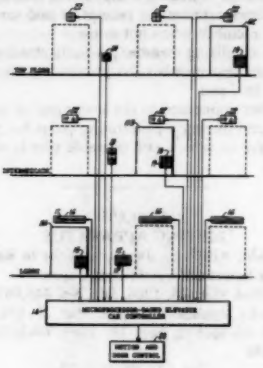
means disposed at a single floor, such as at the lobby, for entering destination calls;

means associated with the processor means for initiating an up-peak service mode;

means associated with the processor means for assigning priority levels to the cars in the up-peak service mode;

means associated with the processor means for determining a maximum number of destination calls to be assigned to a car in the up-peak service mode;

means associated with the processor means for assigning the maximum number of destination calls to the cars in order of their priority level in the up-peak service mode; and



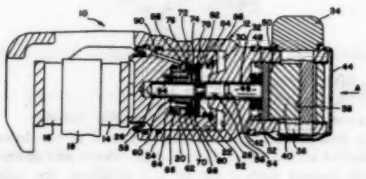
means disposed in the lobby for indicating to passengers the destination calls that have been assigned to each car.

4,691,809

DISC BRAKE WITH AUTOMATIC ADJUSTMENT

Claude Le Marchand, Domont, and Jean-Louis Gerard, Paris, both of France, assignors to Bendix France, Paris, France

Filed Mar. 26, 1986, Ser. No. 844,487
Claims priority, application France, Mar. 27, 1985, 85 04556
Int. Cl.[4] F16D *65/56*
U.S. Cl. 188—71.9 **4 Claims**



1. A disc brake with automatic adjustment of the type including a caliper, a brake actuator which is adapted to act directly upon a first friction component and, by reaction through the caliper, upon a second friction component, the brake actuator including a mechanical control acting upon a hydraulic control piston by means of an automatic adjustment device, the automatic adjustment device formed by a screw and nut device with reversible pitch which is operable by the hydraulic control piston when the control piston travels beyond a predetermined distance defined by a clearance between an annular component and a thrust bearing, the thrust bearing adapted to act upon the screw and nut device and the clearance variable as a function of pressure applied to the control piston, characterized in that when a predetermined control pressure is reached said annular component is moved axially relative to said control piston by means of a monitoring piston slideably and sealingly mounted within said control piston, the annular component movable against a biasing force exerted by a resilient member engaging the annular component and the movement of the annular component neutralizing the automatic adjustment device, the monitoring piston engaging sealingly a surface of a bore in the control piston and within which the monitoring piston is disposed, and that for any control pressure which is less than said predetermined pressure, the predetermined distance is defined by said annular component coming to

bear, by means of said resilient member, against the monitoring piston which bears axially against a bottom of the bore of the control piston and which houses said monitoring piston.

4,691,810

DISC BRAKE WITH PAD PRESSED ONLY AT ENDS WHERE ANTINODES OF VIBRATION OCCUR

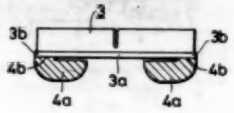
Mikio Matsuzaki, Kasukabe, Japan, assignor to Akebono Brake Industry Company Ltd., Japan

Continuation of Ser. No. 693,893, Jan. 23, 1985, abandoned. This application Sep. 12, 1986, Ser. No. 906,658

Claims priority, application Japan, Feb. 2, 1984, 59-12350[U]

Int. Cl.[4] F16D *65/00, 65/38*

U.S. Cl. 188—73.1 **9 Claims**



1. A disc brake comprising:

a caliper slidable in the axial direction of a rotor to be damped, said caliper including pressure means disposed on one side of said rotor and a pair of pawls having peripheral margins located on the other side of said rotor and spaced circumferentially of said rotor to extend radially thereof,

a pair of pads, one pad being adapted to engage said rotor on one side thereof by said pressure means, the other pad adapted to engage said rotor on the other side thereof by said pair of said pawls under reaction, said other pad having a back metal portion, one of said back metal portion of said other pad and said pair of pawls being provided with ledges at the outer peripheral margins of each of said pawls abutting and in superposed relationship to the other of said back metal portion of said other pad and said pair of pawls along a plane, said ledges defining recesses wherein inward of said outer peripheral margins said pair of pawls are in spaced facing relationship with said back metal portion, and

transmission means for imparting said reaction to said other pad in said plane where said pair of pawls of said caliper and said other pad are in superposed relationship to each other and only at the peripheral margins of the pawls of said caliper and said other pad such that ends of said other pad are pressed at antinodes of vibration.

4,691,811

ROTARY DAMPER

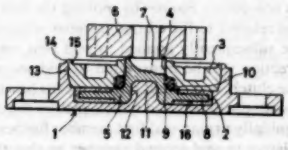
Masaru Arakawa, Chigasaki, and Masanori Numata, Hayamamachi, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Feb. 19, 1986, Ser. No. 831,430

Claims priority, application Japan, Feb. 21, 1985, 60-31418

Int. Cl.[4] F16D *57/00*

U.S. Cl. 188—290 **1 Claim**



1. A rotary damper comprising:

a cylindrical case closed at the bottom and having a housing containing a viscous liquid;

a lid mounted in said case to close said housing and having a central circular hole; and

a rotor having a shaft passing through said hole of said lid, a driven gear secured to its distal end and a brake plate rotatably disposed in the viscous liquid in said housing;

said central circular hole having an increased diameter counterbore portion provided adjacent to said housing opening radially inwardly toward said shaft and axially toward said brake plate, and an O-ring being fitted on said shaft of said rotor and received in said increased diameter counterbore portion such that is axially abuts said lid in said counterbore portion and is radially compressed by the peripheral wall of said increased diameter portion and is exposed axially toward and thereby engages with said brake plate as well as said shaft.

4,691,812

APPARATUS FOR CONTROLLING LOCK-UP CLUTCH OF LOCK-UP TYPE AUTOMATIC TRANSMISSION OF AUTOMOBILE

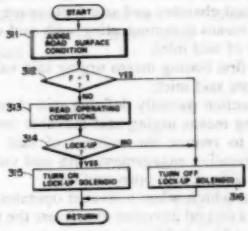
Satoshi Takizawa, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 15, 1986, Ser. No. 852,240

Claims priority, application Japan, Apr. 23, 1985, 60-85309

Int. Cl.[4] F16D *47/06;* **B60K** *41/22*

U.S. Cl. 192—3.3 **9 Claims**



1. An apparatus for controling engagement of a lock-up clutch of a lock-up type torque converter of an automatic transmission mounted within an automobile having road wheels drivingly connected to the automobile transmission, the apparatus comprising:

means for detecting a road surface condition which provides a friction coefficient, between the road surface and the road wheels, less than a predetermined level and generating an output signal indicative of said road surface condition; and

means for prohibiting engagement of the lock-up clutch in response to said output signal.

4. A method of controlling engagement of a lock-up clutch of a lock-up type torque converter of an automatic transmission mounted within an automobile having a wiper system operable by a wiper switch having a rest position and an operation position, and road wheels drivingly connected to the automatic transmission, said method comprising the steps of:

detecting a road surface condition which provides a friction coefficient, between the road surface and the road wheels, less than a predetermined level and generating an output signal indicative of said road surface condition; and

prohibiting engagement of the lock-up clutch in response to said output signal.

4,691,813

FRICTION CLUTCH OPERATED PRESSURE MODULATOR

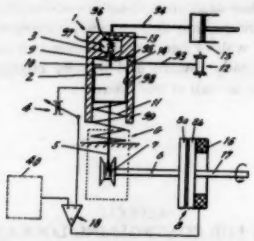
Adam Dittner, Höchstadt; Werner Hutterer, Fürth, and Joachim Sauer, Erlagen, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer KGaA, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 899,212

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530286

Int. Cl.[4] B60T *8/42*

U.S. Cl. 192—13 R **7 Claims**



1. Hydraulic braking apparatus for a wheel-supported land vehicle; said apparatus including:

operator actuated first means for generating hydraulic pressure in said apparatus;

hydraulically operated second means for exerting pressure to stop rotation of a wheel means;

third means for communicating hydraulic pressure from said first means to said second means, said third means including an expandable chamber having an inlet for fluid flow between said chamber and said first means;

said second means communicating with said chamber independently of said inlet;

a valve and first biasing means urging said valve in a direction to close said inlet;

a movable section partially defining said chamber, and second biasing means urging said movable section in a first direction to reduce the volume of said chamber and toward operative engagement with said valve to operate same in a direction to open said inlet;

fourth means which when activated operates said movable section in a second direction to increase the volume of said chamber and away from operative engagement with said valve to permit same to close said inlet;

a control means operatively connected to said fourth means to actuate and deactivate same under predetermined conditions of deceleration for a vehicle having wheel means that is to be braked by said apparatus; and

said fourth means including an electromagnetic clutch having an output operatively connected to said movable section and a driven rotating input that is coupled to said output when said fourth means is actuated.

4,691,814

CLUTCH RELEASE MECHANISM

Maurice J. Wimbush, Whitnash, England, assignor to Automotive Products plc, Leamington Spa Warwickshire, England

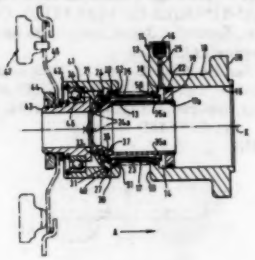
Filed Apr. 25, 1986, Ser. No. 855,719

Claims priority, application United Kingdom, Apr. 27, 1985, 8510781

Int. Cl.[4] F16D *25/00*

U.S. Cl. 192—91 A **17 Claims**

1. A clutch release mechanism for a pull type clutch including a fluid actuator having an actuator member movable by fluid pressure in a clutch release direction to release the clutch, a release bearing assembly for connection to part of the clutch, and coupling means for connecting the release bearing assembly to the actuator, said coupling means comprising a latch member movable by fluid pressure transverse to said direction of clutch release and latch engaging means whereby in a first condition the latch member occupies a position in which it engages the latch engaging means and locks the release bearing assembly axially to the actuator member so that clutch release force applied by said actuator member is transmitted to the



release bearing assembly through the latch member to release the clutch, and in a second condition the latch member is disengageable from the latch engaging means to allow axial separation and coupling of the release bearing assembly and the actuator member.

4,691,815

FRICTION CLUTCH AND CLUTCH RELEASE MECHANISM FOR A VEHICLE

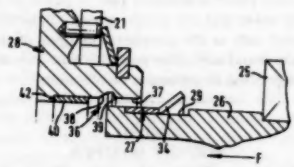
Ian C. Maycock, and Derek Hodgson, both of Leamington Spa, England, assignors to Automotive Products Plc, Leamington Spa, England

Continuation of Ser. No. 552,257, Nov. 16, 1983, Pat. No. 4,632,237. This application Aug. 14, 1986, Ser. No. 896,459

Claims priority, application United Kingdom, Nov. 19, 1982, 8233091

Int. Cl.[4] F16D *23/14*

U.S. Cl. 192—98 **18 Claims**



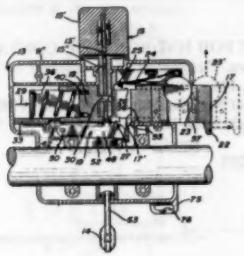
1. A friction clutch for a vehicle, comprising a pressure plate, a driven plate, a spring for urging the pressure plate against the driven plate, and a clutch release mechanism for releasing the driven plate; the clutch release mechanism comprising a first member, a second member, a detent having sections which locate the first member relative to the second member in a non-return manner by moving the first member in one direction relative to the second member whereby a clutch release force subsequently applied to said first member in an opposite direction will be transmitted to said second member to release the clutch, and detent release means having a surface engageable with the detent and which enables the detent to be released by initially urging said first member further in said one direction relative to said second member so that the first and second members can thereafter be separated by subsequently moving said first member in said opposite direction relative to the second member.

4,691,816

LOCKING DEVICE FOR INTERLOCKING NESTED SHOPPING CARTS

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All Inc., Montreal East, Canada

Filed Sep. 19, 1985, Ser. No. 777,526
Int. Cl.[4] G07F 7/00, 17/10
U.S. Cl. 194—212 13 Claims



1. A locking device for interlocking at least two nested shopping carts, said device comprising a housing having attachment means to immovably secure same at a predetermined location on a shopping cart handle, a coinactivated unlocking actuator movably mounted in said housing for displacement on a working axis, said actuator having coin-carrying means having at least one coin slot in a wall of said actuator, actuator spring biasing means to bias said actuator inwardly of said housing to position said coincarrying means and coin slot inside said housing, arresting means limiting inward displacement of said actuator along said working axis in the absence of at least one coin in said carrying means, a locking mechanism displaceably mounted inside said housing and having a lock pin and a lock pin displacing member, a key element receivable in a key slot in said housing and immovably engageable by said lock pin, and an actuator retention member having at least one retention element, one of which has a pin ejector associated therewith for engaging said actuator in said housing, said key element having at least two lock disengaging contact points in a free end of said key for disengaging said engaging means to thereby release said actuator and cause said locking mechanism to engage said key element in said housing, said contact points lying in two different planes and disposed to contact a respective one of said at least one retention element.

4,691,817

FEEDER FOR INTRODUCING AND FEEDING PLATES INTO A MACHINE TOOL

Thomas Haar, Halstenbek, Fed. Rep. of Germany, assignor to Alfons Haar Maschinenbau GmbH & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,938
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437642
Int. Cl.[4] B65G 25/04
U.S. Cl. 198—468.2 2 Claims

1. A feeder for introducing and feeding plates into a machine tool, comprising a feeding carriage provided with a gripping means for seizing an edge of the plates, said carriage is reciprocated by means of a first feeding drive along a first guide, a second guide the axis of which extends orthogonally with respect to the first guide and along which the first guide is adjustable by means of a second feeding drive, a positioning station in which the plates are positioned one after the other with respect to the orthogonal axes, a transfer section between the machine tool and the positioning station, and an automatic control means sensing the working strokes of the machine tool and controlling the feeding drives in synchronism with the movement of the machine tool, a second first guide parallel to said other first guide extends between the positioning station and the machine tool (10) guiding a respective feeding carriage (23, 24) provided with a gripping means (25, 26), and a respective first feeding drive (21, 22), and the two first guides (19, 20) are guided by the second guide (27) and are adapted to be adjusted relative to each other by said second feeding drive

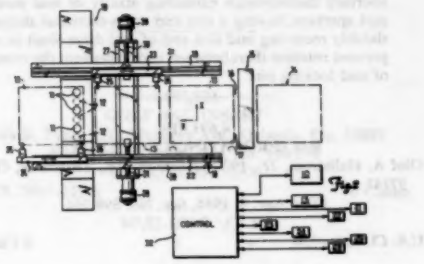


Fig. 2

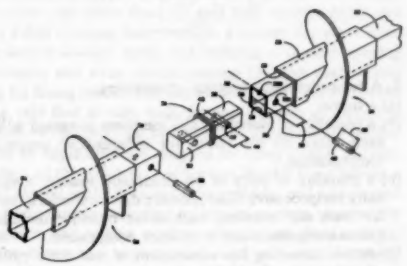
means (28, 29) and the control means (32) controls the first feeding drive means (21, 22) belonging to each feeding carriage (23, 24) in such a manner that the plate (13) is fed into a first processing position adjacent the machine tool (10) after the last working stroke for a preceding plate (13) and before the machine tool (10) performs a further working stroke.

4,691,818

CONCEALED DRIVE COUPLING FOR USE WITH MODULAR SCREW CONVEYOR

Peter G. Weber, LaPlace, La., assignor to The Laitram Corp., Harahan, La.

Filed Jan. 27, 1986, Ser. No. 822,641
Int. Cl.[4] B65G 33/32
U.S. Cl. 197—666 9 Claims



1. A concealed drive coupling system for use with an integrally formed modular screw conveyor comprising:

an elongated drive shaft having a first and further end and an outside perimeter defining a first non-circular cross-section, said first end defining a first aperture extending axially from said first end toward said second end, said first aperture having a second non-circular cross-sectional shape and size, and said first end further defining a second aperture extending from a first location on said perimeter toward a second location on said perimeter;

coupling means having a connecting end and work end, said connecting end having a cross-sectional shape and size for cooperating with said second cross-sectional shape, and being axially and slidably received by said first aperture to join said drive shaft and said coupling means so as to prevent rotation therebetween, said coupling means defining a locking pin recess located in register with said sec-

ond aperture when said coupling means is joined to said drive shaft;

a locking pin extending through said second aperture in said drive shaft and into said locking pin recess in said coupling means so as to prevent axial movement between said coupling means and said drive shaft; and

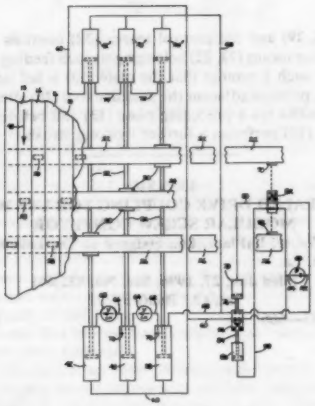
an integrally formed screw conveyor module having an aperture therethrough extending aixally of said module, said aperture, having a size and cross-sectional shape for slidably receiving said first end of said drive shaft so as to prevent rotation therebetween and to prevent the removal of said locking pin.

4,691,819

RECIPROCATING CONVEYOR

Olof A. Hallstrom, Jr., 1920 Hallstrom Rd., Tillamook, Oreg. 97141

Filed Apr. 9, 1984, Ser. No. 598,164
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—750 **9 Claims**



1. A reciprocating conveyor, comprising:

(a) a frame,

(b) a plurality of elongated slat members mounted adjacent each other on the frame for independent longitudinal reciprocation,

(c) a plurality of pairs of longitudinally spaced, longitudinally reciprocative fluid pressure drive cylinders, one pair for each slat member, each drive cylinder including a piston component and a cylinder component,

(d) means mounting one component of said drive cylinders of each pair on the frame and enabling reciprocation of the other component of said drive cylinders of each pair,

(e) means connecting the confronting ends of said other components of each pair of said drive cylinders operatively to the associated slat member with said drive cylinders of the pair extending in opposite directions from said connection,

(f) a source of fluid pressure for reciprocating said other components of said drive cylinders,

(g) fluid pressure control means communicating the source of fluid pressure to the drive cylinders selectively to effect simultaneous extension of said other component of said one drive cylinder of a pair and contraction of said other component of said other drive cylinder of the pair and to reciprocate said other components of said drive cylinders in a manner to effect reciprocation of the slat members in a load conveying direction and in a retracting direction, and

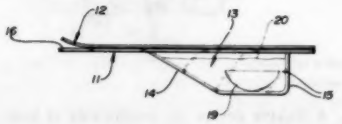
(h) sequencing valve means interposed between the fluid pressure source and one of said drive cylinders of each pair of said drive cylinders for opening and closing communication between said fluid pressure source and said drive cylinder, the sequencing valve means being operable at a predetermined fluid pressure to open said communication for applying fluid pressure to both of said drive cylinders of the pair and operable at a predetermined lower fluid pressure to close said communication for applying fluid pressure only to the other drive cylinder of the pair.

4,691,820

PACKAGE FOR HYDROPHILIC CONTACT LENS

Robert Martinez, Flemington, N.J., assignor to Vistakon, Inc., Jacksonville, Fla.

Continuation of Ser. No. 800,573, Nov. 18, 1985, abandoned.
This application Dec. 11, 1986, Ser. No. 940,710
Int. Cl.[4] B65D *81/24*
U.S. Cl. 206—205 **12 Claims**



1. A package for a hydrophilic contact lens maintained in a sterile aqueous solution comprising:

a molded base having a cavity for containing said contact lens and a flange extending outwardly about the periphery of said cavity,

said cavity being defined by a bottom surface and side wall surfaces extending between said bottom surface and said flange,

a portion of said side wall surface being inclined away from said bottom surface at an angle of from about 130 to 160 degrees, said inclined side wall surface forming a ramp between the bottom of the cavity and said flange, and

a flexible cover sheet releasably sealed to said flange around the perimeter of said cavity, said cover sheet and said flange adjacent the edge of said inclined side wall surface extending outwardly to beyond the area of said seal,

the unsealed edges of said cover sheet and said flange comprising gripping means for separating said cover sheet from said flange to expose said inclined side wall and said cavity;

said package being impermeable to bacteria to preserve sterility,

said package having negligible moisture vapor transmission rate to avoid loss of water; and,

said package being sterilizable.

4,691,821

RECEPTACLE WITH AT LEAST TWO CHAMBERS FOR ACCOMMODATING LIQUIDS AND PULVERIZED SUBSTANCE, ESPECIALLY COFFEE POWDER, MILK AND/OR SUGAR

Raimund Hofmann, Kreuzwertheim, Fed. Rep. of Germany, assignor to Jan Folkmar, Zurich, Switzerland

Filed Jan. 13, 1986, Ser. No. 818,530
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1985, 3527124
Int. Cl.[4] B65D *83/06, 81/32*
U.S. Cl. 206—216 **9 Claims**

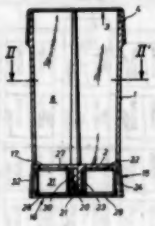
1. Apparatus for retaining substances in the form of a liquid or pulverized solid and for delivering portions of one of said substance of preselected volume, said apparatus comprising:

a receptacle of cylindrical shape with at least two compartments;

a chamber of said preselected volume being arranged on one end of said receptacle and having a chamber opening;

a ring-shaped operating member being arranged at said one end of said receptacle and defining said chamber of said preselected volume within the reing-shaped operating member, and being rotationally mounted on said one end of said receptacle;

said chamber being movable together with said operating member between a first position providing a passage communication with one of said compartments of the receptacle, and a second position closing said passage and opening said chamber to the atmosphere;



a cover secured to said receptacle and being arranged on the side of said receptacle opposing to said operating member; and

a closure of sufficient size to seal said chamber opening against the armosphere when the chamber is not in the second position;

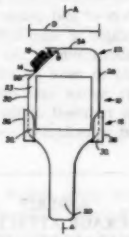
further comprising an opening in said receptacle and an opening in said closure, and in which said chamber contains a first opening communicating with said receptacle opening when said chamber is in said first position, and a second opening communicating with said closure opening when said chamber is in said second position.

4,691,822

CONTAINER AND HOLDER FOR DISPENSING BAKING SODA

Irvin P. Malancon, Jr., P.O. Box 383, Cut Off, La. 70345

Filed Apr. 7, 1986, Ser. No. 849,261
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—229 **19 Claims**



1. A container and holder assembly for containing and dispensing baking soda comprising:

a. a hollow container body means for holding baking soda adapted for mounting in a vertical position, said container body means having an elongated, generally cylindrical handle axially aligned with a generally rectangular upper portion integrally molded with said handle, said upper portion having spout means integrally molded therewith, said upper portion having two generally vertical sidewalls parallel to each other and to the longitudinal axis of said container body means, said upper portion having a front wall and a back wall parallel to each other and to the longitudinal axis of said container, said upper portion having a generally rectangular top section perpendicular to said longitudinal axis of said container body means, said upper portion having a sloping planar section connected to said top section and forming an angle B therewith, said spout means being located on said planar section, and

b. holder means for slidably receiving said container body means.

4,691,823

GOLF BAG INSERT

Kenneth R. Pape, 1011 Marlowe Ave., Orlando, Fla. 32809

Filed Dec. 22, 1986, Ser. No. 944,576
Int. Cl.[4] A63B *55/00*
U.S. Cl. 206—315.6 **6 Claims**

1. An insert for a golf bag for separating groups of clubs within the golf bag, said insert including a first divider body for extending generally across the golf bag, and a second divider body extending generally perpendicularly to said first divider body, a first cap piece fixed to said first divider body and defining a first opening therethrough, a second cap piece fixed to said second divider body and defining a second opening therethrough, and strap means passing through said second opening for fixing said second cap piece to the upper end of the golf bag, said first divider body having a length to extend to the bottom of the golf bag, and said first divider body further including an angled portion adapted for lying against the bottom surface of the golf bag, said second divider body having a length to extend to the bottom of the golf bag, and said second divider body further including an angled portion adapted for lying against said angled portion of said first divider body, means for fixing said angled portion of said second divider body to said angled portion of said first divider body, and means for fixing said angled portions to the bottom of the golf bag.

4,691,824

WRAP-AROUND PACKAGING

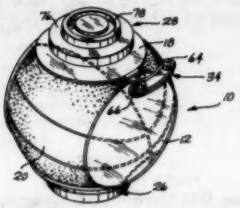
Edgar C. Schindler, 11723 136th Ave. E., Puyallup, Wash. 98374

Filed Oct. 30, 1986, Ser. No. 924,990
Int. Cl.[4] B65D *25/28, 8/18, 85/00*
U.S. Cl. 206—315.9 **11 Claims**

1. An apparatus for packaging an item, comprising:

a plurality of at least four cupping members each having an inwardly directed recess shaped to substantially form-fit against a portion of the item's outer surface, said members being connected together in juxtapositional series in a

manner so that they cooperatively circumscribe said item; and



snap fastening means for releasably connecting a first member of said series to a last member of said series, to hold said item between said members.

4,691,825

NEEDLE PACKAGE

Peter-Nikolaus Schmetz, Herzogenrath, and Peter Klöcker, Würselen, both of Fed. Rep. of Germany, assignors to Firma Ferdinand Bernhard Schmetz, Herzogenrath, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,745
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—380 **7 Claims**

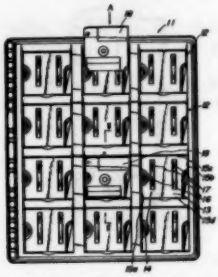
1. Needle package formed of a plate-like panel having a front side and a back side, said panel having a plurality of elongated side-by-side needle pockets recessed inwardly from the front side of said panel and closed by the back side of said panel, said panel forming a plurality of side walls extending from the front side toward the back side of said panel and forming oppositely elongated side walls of said needle pockets, a removal cavity extending transversely of the elongated direction of said needle pockets, wherein the improvement comprises that said needle pockets have opposite ends spaced apart in the elongated direction thereof, each of said side walls having a clamping web extending into said needle pocket for holding a needle between said clamping webs on the opposite side of each said needle pocket, a bottom bar located in the back side of said plate-like panel for each said needle pocket and extending between said clamping webs of the associated said needle pocket, and said clamping webs being displaceable outwardly away from one another and relative to said bottom bar when a needle is inserted into said needle pocket.

4,691,826

INFORMATION RECORDING CARRIER-HOLDING FRAME

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,898
Claims priority, application Japan, Nov. 26, 1985, 60-263660
Int. Cl.[4] B65D *1/24, 85/30, 85/57*
U.S. Cl. 206—456 **7 Claims**



1. An information recording carrier-holding frame comprising:

a file sheet including a substantially perpendicular depression peripheral wall defining a rectangular depression having a bottom wall and four side walls;

planar lugs projecting inwardly from two of said four side walls, said two side walls being opposed to each other;

support means rising from said bottom wall for supporting an information recording carrier in contact with said planar lugs, said support means being spaced at a specific interval from said four side walls, the remaining two of said four side walls being opposed to each other and one of said two remaining side walls being located at an insertion side of the information recording carrier holding frame for insertion of the information recording carrier, and

a portion of said support means located furthest away from said one wall located at said insertion side being located further away from said one wall located at said insertion side than a portion of said planar lugs located closest to said one wall located at said insertion side to provide a fulcrum point about which the information recording carrier is pivoted to raise an edge of said information recording carrier above said one wall located at said insertion side for removal of the information recording carrier from said information recording carrier-holding frame.

4,691,827

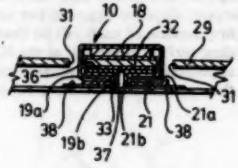
SUPPORTED PACKAGE ATTACHED TO PANEL IN PARALLEL SLOTS

Ronald Grace, and Mary D. Grace, both of 61 Inverlochy Boulevard, Unit 11, Thornhill, Ontario, Canada L3T 3R4

Filed May 8, 1986, Ser. No. 861,337
Int. Cl.[4] B65D *73/00;* **A45C** *11/28*
U.S. Cl. 206—465 **8 Claims**

1. A supported package for displaying small items, comprising a generally tubular sleeve comprising transparent material through which small items placed inside the sleeve can be viewed, and a generally planar support member on which the sleeve in flattened form is disposed, the support member comprising an upper sheet having a pair of spaced parallel slots therein, a lower sheet parallel to the upper sheet, and an auxilaiary portion extending rearwardly from the upper sheet between said slots toward said lower sheet and defining a recess on each side of the auxilaiary portion between the upper

and lower sheets, each end of said flattened sleeve being folded over on itself and inserted through a respective said slot and disposed in a respective recess and the upper and lower sheets compress each folded over end of the sleeve between them in



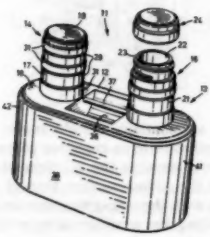
each respective said, whereby movement of the end of the sleeve transversely of the slot in the direction parallel to the plane of the upper sheet and unfolding of the folded over end and withdrawal thereof from the slot is resisted.

4,691,828

CONTAINER FOR LIQUIDS

Joseph Z. Slusarczyk, and Nancy L. Slusarczyk, both of R.R. 190 1, Burford, Ontario, Canada N0E 1A0

Filed Dec. 10, 1985, Ser. No. 807,466
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—509 **9 Claims**



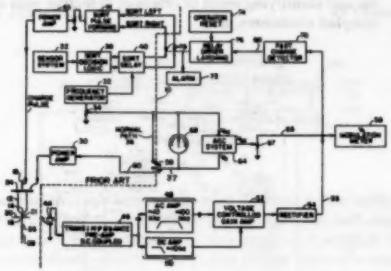
1. A container for liquids comprising a shell of resilient plastic defining an elongated generally rectangular hollow body having a longitudinal axis, two longitudinally spaced hollow posts upstanding from an upper generally planer side thereof, each post being closely adjacent a respective end of said elongated hollow body, a generally planar lower side on which the container can stably support itself on a planar surface having therein two recesses aligned with said posts in which the posts of similar containers may be snugly received, one post having an opening at its upper end for filling the container and emptying liquid from it, the ends of the body being convexly rounded and the lateral walls and ends of the body being continuously smooth, and wherein the body is provided with a cavity extending downwardly in said upper side between the posts in which an elongated handle grip is formed, the handle grip being disposed below the general plane of said upper side and extending between the posts along said longitudinal axis.

4,691,829

METHOD OF AND APPARATUS FOR DETECTING CHANGE IN THE BREAKOFF POINT IN A DROPLET GENERATION SYSTEM

Robert E. Auer, Miami, Fla., assignor to Coulter Corporation, Hialeah, Fla.

Continuation-in-part of Ser. No. 203,121, Nov. 3, 1980, Pat. No. 4,487,320. This application Dec. 6, 1984, Ser. No. 678,613
The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.
Int. Cl.[4] B07C *5/342*
U.S. Cl. 209—3.1 **5 Claims**



1. In an apparatus for analyzing and sorting particles suspended in a liquid, said apparatus including first means for producing a jet stream from said liquid suspension, second means for vibrating said jet stream to produce undulations on the surface of said stream and subsequent breakup of said stream into droplets for collection downstream, said stream having a breakpoint region, the improvement comprising:

radiation means for impinging a beam of radiation upon an uninterrupted portion of said jet stream during its analyzing and/or sorting mode at a fixed location thereon prior to the breakpoint region,

sensing means, coupled to said second means, responsive to radiation from said radiation means which is scattered by said stream, for providing an output to said second means which is proportional to the amplitude of undulation at said location, and

wherein said second means is positioned above said radiation means.

4,691,830

INSPECTION AND SORTING OF MOLDED CONTAINERS AS A FUNCTION OF MOLD OF ORIGIN

Alan D. Ahl, Toledo; Joseph F. Billmaier, Maumee; Paul W. L. Graham, Toledo, all of Ohio; Mark B. Schenk, Lexington, Ky., and Stephen H. Zylka, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 26, 1985, Ser. No. 769,527
Int. Cl.[4] B07C *5/34*
U.S. Cl. 209—523 **12 Claims**

1. A system for inspecting and sorting molded containers formed in a mold machine having a plurality of mold cavities, each said container containing readable indicia indicative of mold cavity of container origin, said system comprising

first conveyor means for transporting containers along a predetermined path,

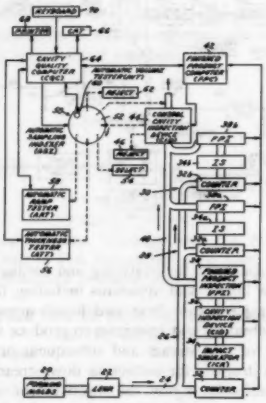
inspection means disposed in said path for inspecting containers travelling in said path and including first cavity identification means for identifying mold cavity of origin of defective containers,

second cavity identification means disposed in said path for reading said indicia on containers travelling in said path and including means for selectively sorting containers

from said path as a controllable function of cavity identification,

first control means coupled to said inspection means for receiving information identifying mold cavity of origin of defective containers and to said second cavity identification means for selectively controlling said second cavity identification means to sort all containers having indicia indicative of mold cavities of defective containers,

sample testing means including second conveyor means coupled to said second cavity identification means for receiving a sampling of said containers from said path, and means coupled to said second conveyor means for automatically testing physical quality of said sampled containers and identifying mold of origin of defective ones of said sampled containers, and



second control means coupled to said sample testing means and through said first control means to said second cavity identification means for automatically sorting said sampling of containers wherein said sample comprises a preselected sample of containers from each cavity and routing said preselected sample of containers to said sample testing means,

said second control means including means forming a cavity map which relates cavity identification to physical location of the associated mold cavity in the mold machine, means responsive to said first control means for identifying mold cavity indicia read by said second cavity identification means associated with mold cavities absent from said map, and means for automatically routing a preselected number of consecutive containers bearing said absent indicia to said automatic sample testing means to certify quality of said absent cavity.

4,691,831

IC TEST EQUIPMENT

Kenpei Suzuki; Yushi Iwanaga; Hiroshi Sato; Kohei Sato; Noriyuki Igarashi, and Shinichi Koya, all of Tokyo, Japan, assignors to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,560

Claims priority, application Japan, Jun. 25, 1984, 59-95641[U]; Jun. 27, 1984, 59-97581[U]; Jun. 29, 1984, 59-98841[U]

Int. Cl.⁴ B07C *5/344*

U.S. Cl. 209—573 **14 Claims**

1. IC test equipment comprising:

a loader for loading IC elements to be tested;

a testing station for testing the IC elements supplied from the loader;

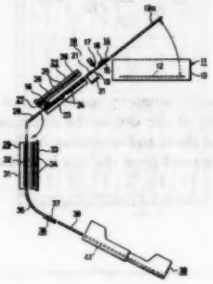
a sorting station supplied with the IC elements tested in the testing station, for sorting them according to their test results; and

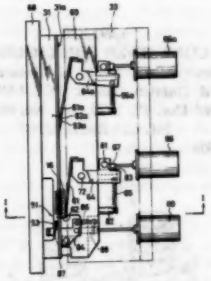
an unloader for receiving the IC elements sorted by the sorting station;

wherein the testing station comprises:

rails for guiding the IC elements supplied from the loader;

an auxiliary stopper disposed opposite but aslant to the IC element sliding surface of each rail so that it goes away from the sliding surface of the rail as the IC element supply side is approached, the end portion of the auxiliary stopper on the opposite side from the IC element supply





side being bent substantially at right angles to the sliding surface of the rail to form an engaging piece, the auxiliary stopper resiliently pressing the IC element sliding down the rail against the sliding surface thereof and engaging the IC element with the engaging piece to stop it;

means for controlling the auxiliary stopper to disengage it from the IC element; and

a main stopper disposed slightly ahead of the engaging piece of the auxiliary stopper whereby the IC element disengaged by the disengaging means from the auxiliary stopper and sliding down the rail is stopped at the position for test.

4,691,832

STEP-LIKE FLOWER-BOX SUPPORT STRUCTURE

Horea Steiger, Untermaettli, 8913 Ottenbach/Zarich, Switzerland

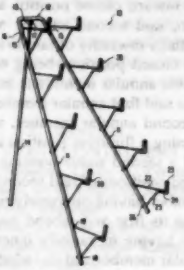
Filed Nov. 4, 1986, Ser. No. 926,535

Int. Cl.⁴ A47F *7/00*

U.S. Cl. 211—71 **18 Claims**

1. A step-like flower-box support structure consisting of relatively few parts which can be easily shipped and assembled at the customer to support thereon a relatively great weight of flower boxes, comprising two tubular members, a substantially bow-shaped member for connecting the two tubular members into a generally U-shaped assembly, a third tubular member,

first means for connecting said third tubular member with said substantially bow-shaped member to form a tripod support structure of generally pyramid-like configuration, a plurality of flower-box support members, and second means for detachably connecting said support members to said two tubular members in such a manner as to form the step-like flower-box support structure whose support members extend forwardly of the support structure.



4,691,833

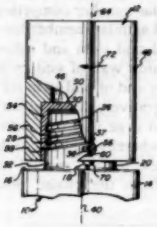
CAP ALIGNMENT STRUCTURE

Warren S. Ahrens, Milford, Conn., assignor to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.

Filed Feb. 15, 1985, Ser. No. 701,976

Int. Cl.[4] B65D *41/04*

U.S. Cl. 215—227 **23 Claims**



1. A container and a cap assembly therefor comprising:

a. a container having a main body member with a noncircular circumference and an imaginary center plane therethrough and a neck member with a pair of integrally formed exterior double lead threads emanating from a base portion thereof, said double lead threads and said base portion cooperating to define a pair of diametrically opposed abutment end walls, said main body member of said container includes a shoulder having diametrically opposed projections thereon; and

b. a cap assembly having a noncircular circumference and an imaginary center plane therethrough, and a pair of integrally formed interior double lead threads adapted for mating engagement with said double lead threads of said neck member, said double lead threads of said cap assembly having diametrically opposed leading end walls defining abutment surfaces, said cap assembly also having diametrically opposed projections thereon, whereby said cap assembly is adapted to be screwed on to the neck of said container until said abutment surfaces of said cap assembly engage said abutment end walls of said neck member so that said center planes of said container and said cap assembly achieve coplanarity, said projections of said container and said cap assembly cooperatively dimensioned to produce a force tending to hold said container and cap assembly in assembly when said abutment end walls and said abutment surfaces are in engagement.

4,691,834

CAP AND NECK STRUCTURE FOR A WIDE MOUTH JAR

Joseph J. Bullock, III, Atherton, Calif., assignor to Bankers Trust Company, New York, N.Y.

Continuation-in-part of Ser. No. 689,859, Jan. 3, 1985, Pat. No. 4,625,876, which is a continuation of Ser. No. 515,275, Jul. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 387,550, Jul. 12, 1982, Pat. No. 4,438,857. This application May 2, 1986, Ser. No. 858,811

Int. Cl.[4] B65D *41/48*

U.S. Cl. 215—232 **15 Claims**

1. A cap of the type having a central top disc, a thin-walled substantially cylindricl outer skirt depending from said disc, first bead means on the interior of said outer skirt adapted to engage cooperating second bead means on the neck of a container, a circumferential score line in said outer skirt above at least a lower portion of said bead means, a portion of said outer skirt below said score line being cut away to form a pull tab extending in a direction parallel to said score line, whereby upon pulling said tab circumferentially, said outer skirt severs along said score line, said lower portion of said bead means being removed as said tab is pulled, the improvement comprising a horizontal slit formed in said outer skirt in line with said circumferential score line and extending in a curve to a terminus, the portion of said skirt within said slit comprising said tear tab, there being a frangible link between said tear tab and the adjacent portion of said skirt, said skirt being formed with a notch extending up to the bottom edge of said link and said terminus being at the upper edge of said link, said link being spaced up from said bottom edge to a position about midway of the height of said tear tab.

4,691,835

TAMPER-EVIDENT SEALED CONTAINER AND TAMPER-EVIDENT TUBE AND BANDS AND APPARATUS AND METHOD OF MAKING AND USING SAME

Martin L. Mueller, 4929 East Lake Shore Dr., Wonder Lake, Ill. 60097

Continuation of Ser. No. 451,401, Dec. 20, 1982, abandoned. This application Feb. 4, 1986, Ser. No. 827,208

Int. Cl.[4] B65D *55/02*; B65B *13/02*

U.S. Cl. 215—246 **3 Claims**

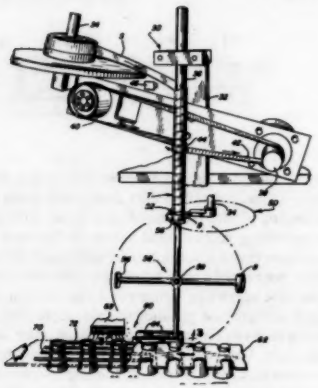
1. A method of continuous making and applying a plurality of individual heat-shrinkable cylindrical tubular bands each adapted for subsequent heat-shrink application to a container, comprising the steps of:

providing an elongated continuous strip entirely comprising heat-shrinkable, expanded polystyrene foam plastic material, wherein said plastic material is oriented and heat-shrinkable primarily in the direction of the length of said strip;

providing a relatively fixed, cylindrical winding mandrel means having a free end;

continuously advancing said strip onto said winding mandrel means at a portion thereof spaced from the free end of the mandrel means, said strip being advanced onto said mandrel means at an acute angel with respect to a plane perpendicular to the axis of said winding mandrel means to continuously spirally wind said continuous strip on and

about winding mandrel means, including overlapping and joining edge portions of said continuous strip, to thereby continuously form a generally cylindrical spirally-wound heat-shrinkable tube of said plastic material which includes a spiral heat-shrinkable seam at said overlapping edge portions, said tube being advanced axially of said winding mandrel means toward said free end thereof, wherein said continuous strip is wound at said acute angle to provide an angle of intersection between said primary direction of orientation and a plane perpendicular to the axis of said tube such that said orientation and shrinkability of said strip primarily in the direction of its length results in said spirally-wound tube being primarily heat-shrinkable in a radial direction;



continuously severing spirally-wound lengths from said tube to provide said individual heat-shrinkable tubular bands each in a generally cylindrical spirally-wound configuration wherein each said tubular band is primarily heat-shrinkable in a radial direction;

positioning each said individual tubular band in respective association with one of a plurality of said containers; and

heating said individual tubular bands whereby each said band is heat-shrunk primarily in the radial direction thereof to embrace the respective one of said containers.

2. The combination of a container having a heat-shrunk, spirally-wound tubular band thereon formed in accordance with the method of claim 1.

4,691,836

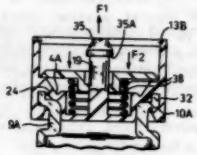
APERTURED CLOSURE DEVICE WITH DEPRESSIBLE DISC PORTION

Victor Wassilieff, 84, rue de l'Assomption, 75016 Paris, France

Continuation of Ser. No. 456,114, Jan. 6, 1983, abandoned. This application Dec. 13, 1985, Ser. No. 808,667

Int. Cl.[4] B65D *39/16*

U.S. Cl. 215—298 **3 Claims**



1. A closure device for a fluid receptacle having an outlet aperture, said closure device comprising a first generally annular member adapted to be fixed relative to the receptacle adjacent the aperture in the receptacle, coupling means for fixedly coupling the first annular member to the receptacle adjacent the aperture in the receptacle, a second generally annular member substantially coaxial with said first annular member, said second annular member being axially movable mounted between an axially inward closed position and an axially outward open position, said second annular member being disposed generally radially inwardly of said first annular member, both the open and closed positions being stable positions, an elastically deformable annular membrane member having one end fixed relative to said first annular member and another end of retaining said second annular member, said annular membrane member defining a flip-over position intermediate a first stable position and a second stable position corresponding to said open and closed positions of said second annular member, said membrane member having oppositely tapering frustoconical configuration in its first and second stable positions, said membrane member having its radially inner periphery joined to said second annular member and its radially outer periphery joined to said first annular member, portions of at least one of said members defining a fluid passageway for communication between the interior of the receptacle and the surroundings for discharging fluid from the receptacle when said second annular member is in the open position, and valve means defined by one of said second annular member and said membrane member co-operatable with a valve seating means for closing off the passageway in the closed position of said second annular member, said membrane member defining means for biasing said first annular member into its closed position, the vertical position of said membrane member in the closed position of said second annular member being between its first stable position and the position in which it is molded, and immediately above the latter, so that the said membrane member elastically forces said second annular member valve means axially against said valve seating means for tightly closing off said passageway. Wherein said first annular member comprises a generally cylindrical skirt, said second annular member having a central stem, a disc received around said stem and extending between the central stem and the inner wall of said cylindrical skirt, abutment means at the outer end of said stem for retaining said disc and resilient means operatively disposed between said disc and said second member to urge said disc into engagement with said abutment means, whereby said disc is depressible to grasp said stem to gain access to said second annular member to permit displacement from the closed position to the open position.

4,691,837

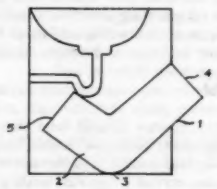
GARBAGE CAN

Linwood E. Dillon, 1511 W. 14th St., Hastings, Minn. 55033

Filed Oct. 23, 1986, Ser. No. 923,016

Int. Cl.[4] B65D *33/00*

U.S. Cl. 220—1 T **1 Claim**



1. A garbage can suitable for use under a sink, said garbage can comprising:

a generally J-shaped chute formed as a single piece, said chute having a first, vertical leg formed at generally right angles to a second, horizontal leg;

said right angle formed between said first and second legs

being a curved bend so as to provide a pivot point on the exterior bottom surface of said right angle bend;

said first leg having a generally rectangular opening at the top;

said second leg being closed at its generally rectangular end;

said garbage can being capable of being positioned under said sink so that said garbage can is upright when the door to the undersink area is closed, and is tipping outward but prevented from tipping completely over by the gooseneck pipe of said sink when said door is open.

4,691,838

PAINT CONTAINERS

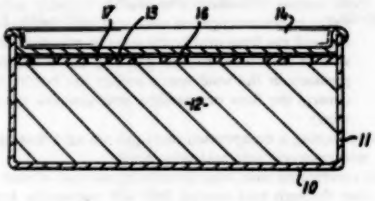
Thomas Graham, Clitheroe; Leslie A. Perrins, Blackburn, and Kevin Morris, Bury, all of England, assignors to Reed International plc, London, England

Filed Dec. 13, 1984, Ser. No. 681,317

Claims priority, application United Kingdom, Dec. 16, 1983, 8333664; Aug. 31, 1984, 8422049

Int. Cl.⁴ B44D *3/12*

U.S. Cl. 220—93 **3 Claims**



1. Structured paint of non-pouring consistency presented in a flat nominally rectangular container having side walls, the paint supporting at its surface a membrane with multiple openings of mean transverse dimension greater than 5 mm lying in lines which are inclined to said side walls through which openings the paint can pass when the membrane is swept by a roller-applicator and having, taken with the paint, these features:

(a) the membrane is non-flaccid but flexible to allow paint to pass through the openings by extrusion so that when the roller-applicator sweeps the membrane surface the paint presents itself as extruded reliefs of structured paint at the openings in the membrane to give the roller-applicator an application of structured paint reliefs while the membrane still remains supported by the paint surface at at least points other than in the vicinity of the roller-applicator, the membrane flexing from the pressure of the roller-applicator as it sweeps the membrane surface, the flexing causing the paint to extrude through the membrane openings and the membrane returning to a substantially unflexed state upon removal of the roller-applicator pressure, and

(b) the membrane can follow the fall of the surface of the paint as it is consumed.

4,691,839

SINGLE FINGER-OPENING RESILIENT CAP

Myron Ullman, Canfield, Ohio, assignor to The Dover Molded Products Company, Youngstown, Ohio

Filed Oct. 17, 1986, Ser. No. 920,929

Int. Cl.⁴ B65D *43/04*

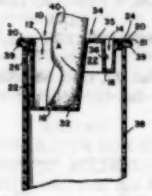
U.S. Cl. 220—281 **14 Claims**

1. A single finger opening resilient cap for insertion into a container opening to releasably close the opening, comprising:

a top wall with edge portions which form a rim having a size which is greater than that of a container opening that is to be closed by the cap, said rim being configured to overlay container portions which surround the container opening, said top wall defining a first plane;

a finger-receiving well formed in said top wall, including a bottom wall and a slanted side wall extending between said top wall and said bottom wall, said slanted side wall defining a second plane disposed at an angle relative to said first plane, said well being of size sufficiently large to receive therewithin a finger;

a contractably-biasing well formed in said top wall including a bottom wall at a level higher than the bottom wall of said finger receiving well, and a slanted side wall extending between said top wall and said bottom wall, said



slanted side wall defining a third plane disposed at an angle relative to said first plane, said contractably-biasing well being smaller than said finger-receiving well;

a circumferentially-surrounding side wall portion which depends from said top wall at locations inset from said rim and which forms at least part of the walls of said wells;

locking means carried on said circumferentially-surrounding side wall portion for engaging said closure opening;

whereby single finger force exerted on said slanted side wall within said finger-receiving well will deform said cap thereby disengaging said locking means from said closure opening and thereby releasing said cap from said closure opening.

4,691,840

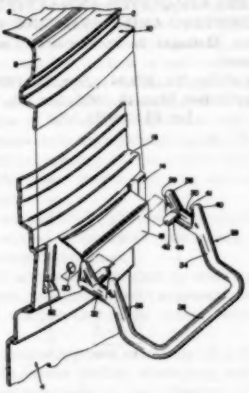
LID LOCKING HANDLE FOR WASTE CONTAINER

Raymond B. Ferbrache, Winfield, Kans., assignor to Gott Corporation, Winfield, Kans.

Filed Nov. 12, 1986, Ser. No. 929,488

Int. Cl.¹ B65D *45/00*

U.S. Cl. 220—318 **20 Claims**



1. A refuse container comprising:

a receptacle body having vertical side walls and a central cavity extending downwardly there between;

a lid having a downturned peripheral rim receivable over a

top end of said receptacle body, said lid having peripherally located detent means;

at least one lid locking handle having an inward end pivotally coupled to said receptacle body side walls and an outward free end; said handle having camming handle locking projection means and lid locking projection means for respective engagement against said receptacle body side walls and said lid detent means as said handle free end is pivoted toward said receptacle body.

4,691,841

CONTAINER FOR A PLASTIC TRASH BAG OR THE LIKE

Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33069

Filed Jan. 21, 1986, Ser. No. 819,933
Int. Cl.[4] B65D *25/10*
U.S. Cl. 220—404 **5 Claims**

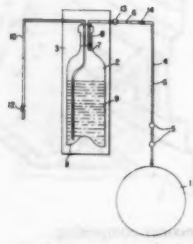
1. The trash container comprising an open top box-like body having a plurality of side walls arranged in polygonal cross section, a vane located in each corner of said body having means at its upper end to ensnare a flexible bag and an open cap frame having a plurality of side walls arranged in a conforming cross section to that of said body and adapted to fit over the top of said body, said frame having a finger extending downwardly along at least one of its side walls below the lower edge thereof to overlay the edge of said bag ensnared on said vanes and to thereby hold said bag open in substantially conforming cross section to that of said body.

4,691,842

PROCESS APPARATUS AND SYSTEM FOR PRESERVING AND DISPENSING WINE

Jacques Foures, Domaine de la Meunière Cenac, 33360 La Tresne, France

Continuation of Ser. No. 209,141, Nov. 21, 1980, abandoned. This application Mar. 18, 1985, Ser. No. 712,924
Int. Cl.[4] B67D *1/04*
U.S. Cl. 222—1 **3 Claims**



1. A method for preserving and dispensing wine from a bottle partially filled with said wine, said method comprising:

(a) providing an apparatus for preserving and dispensing wine including:

(i) a hermetically and thermally sealed enclosure for said wine bottle;

(ii) at least one reservoir adapted to contain said inert gas;

(iii) a first line for gas flow having one end connected to said reservoir and a second end terminating within said wine bottle adjacent to said plug, said second end being located between said plug and said wine;

(iv) at least one pressure reducing valve positioned along said first line adjacent said reservoir;

(v) at least one valve located in said first line downstream of said pressure reducing valve for preventing surges or blasts of pressure within said first line;

(vi) a second line for liquid flow having one end positioned within said wine bottle adjacent the bottom of said wine bottle and within said wine and a second end located outside said wine bottle and enclosure;

(vii) a spigot for controlling the flow of wine through said second line wherein said gas under pressure is compressed gas and wherein the low pressure gas introduced into said void space is sufficient to force said wine into said second line; and

(viii) means including a manually variable adjustment valve in communication with said wine bottle for venting said gas from said bottle so as to minimize the exposure of said wine to said gas, and for controlling the pressure in the void space within the bottle, so as to control the flow or non-flow and diminish the flow of wine;

(b) directing a compressed inert gas via said first line from said reservoir into said wine bottle;

(c) conducting said wine from said one end of said second line through said second line and outwardly from said wine bottle towards said second end of said second line so as to dispense wine from said wine bottle; and

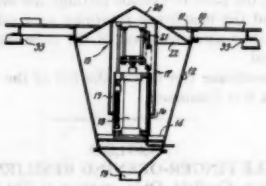
(d) operating said manually variable adjustment valve to vent said gas from said wine bottle during periods of storage of said wine bottle in said enclosure between periods of dispensing so as to minimize exposure of wine to said gas.

4,691,843

MATERIAL DISCHARGE APPARATUS

Andrew J. Dunaa, Tufley, England, assignor to Solitec Limited, Gloucester, England

Continuation of Ser. No. 652,461, Sep. 20, 1984, abandoned, Continuation of Ser. No. 284,501, Jul. 17, 1981, abandoned. This application Nov. 29, 1985, Ser. No. 802,817
Claims priority, application United Kingdom, Jul. 11, 1983, 83 24314
Int. Cl.[4] B65G *69/06*
U.S. Cl. 222—58 **6 Claims**



1. Material discharge apparatus comprising: a material receiving chute having an upper and lower portion; a closure member having a continuous surface extending transversely across the upper portion of said material receiving chute in a closed, lowered position of said closure member and movable relative to the chute along a vertical axis between raised and lowered positions to control flow of material into the lower portion of said material receiving chute from a bulk store

thereof above the latter; a discharge opening in the lower portion of said chute; an actuating device having a movable part for moving said closure member between raised and lowered positions; and vibrating means located within the material receiving chute and aligned with the vertical axis of said closure member to impart thereto a linear oscillatory motion in a direction parallel to the direction of movement of the closure member by said actuating device, characterized in that said actuating device is mounted centrally beneath the closure member and within the material receiving chute, and in that the movable part of the actuating device is attached to said vibrating means and moves along a single central axis aligned with the vertical axis of the closure member, thus serving to move said closure member and said vibrating means between raised and lowered positions.

4,691,844

IMMERSION NOZZLE FOR CONTINUOUS CASTING

Yoshihiro Ishino; Sadanobu Sugiura, and Kunishige Tokunaga, all of Kariya, Japan, assignors to Toshiba Ceramics Co., Ltd., Japan

Filed Mar. 5, 1987, Ser. No. 22,058
Claims priority, application Japan, Aug. 8, 1986, 61-186522
Int. Cl.[4] B22D *11/10*
U.S. Cl. 222—591 **10 Claims**

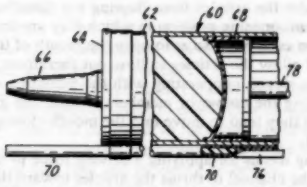
1. An immersion nozzle for continuous casting, comprising an elongated nozzle body and a conduit extending longitudinally through said nozzle body, said nozzle body having an interior surface defining said conduit, at least a portion of said interior surface being formed of a refractory material including 40–92 wt.% ZrO_2, 5–40 wt.% C, and 3–20 wt.% of an admixture of RO and RO_2 wherein RO is at least one member selected from the group consisting of CaO, MgO and MnO; and RO_2 is at least one member selected from the group consisting of SiO_2 and TiO_2.

4,691,845

DISPENSING CONTAINER

Thomas W. Schwartz, Troy, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 31, 1985, Ser. No. 739,687
Int. Cl.[4] B65D *35/22, 88/54*
U.S. Cl. 222—94 **4 Claims**



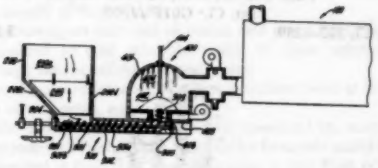
2. In a dispensing container of the type comprising a tube having an axis and first and second ends, a transverse end wall fixed at the second end of said tube, a nozzle having one end attached in said end wall and projecting from the side of said end wall opposite end tube, a first material to be dispensed contained within said tube, and a plunger slidably mounted within said tube for movement from a first position adjacent the first end of said tube to a second position adjacent said end wall to dispense said first material through said nozzle, the improvement wherein said container further includes at least one hose of a uniform cross sectional area along its length, said hose being fixed along and in contact with the outer surface of said tube, extending from adjacent said first end past and through said end wall; and having a flexible wall; a second material to be dispensed contained within said hose; and means for affording displacement of said second material from said hose in an amount proportional to the amount of said first material displaced from said tube upon movement of said plunger toward said second position by flattening of the wall of said hose against said tube.

4,691,846

METHOD AND APPARATUS FOR GASIFYING SOLID ORGANIC MATERIALS

Henry L. Cordell, 795 Gordon Rd., and David G. Galer, 1657 Mapes Rd., both of Mio, Mich. 48647

Filed Jun. 11, 1985, Ser. No. 743,529
Int. Cl.[4] G01F *11/20*
U.S. Cl. 222—198 **10 Claims**



1. A storage hopper for storing solid materials and for dispensing said solid materials, said storage hopper comprising:

wall means defining a chamber that has an opening at the top for receiving said solid materials and a restricted opening at the bottom of said chamber for dispensing said solid materials, said wall means comprising:

a first portion which extends outwardly and upwardly from said restricted opening; and

an opposed second portion which extends outwardly and upwardly from said restricted opening for directing said solid materials toward said restricted opening;

first reciprocable plate means lying along and substantially parallel to said first portion of said wall means;

second reciprocable plate means lying along and substantially parallel to said second portion for preventing the compaction of said solid materials as said solid materials move downwardly through said chamber from said top to said restricted opening by the reciprocation of said first reciprocable plate means and said second reciprocable plate means;

means for reciprocating said first reciprocable plate means and said second reciprocable plate means, said means for reciprocating comprising:

first support arm means attached to said first reciprocable plate means, said first support arm means extending from said first reciprocable plate means through said wall means;

oscillatable means disposed externally of said chamber, said oscillatable means further contacting said first support arm means externally of said chamber, said oscillatable means comprising a link having an end pivotally attached to said first support arm means;

means for oscillating said oscillatable means, said means for oscillating comprising a shaft non-pivotally attached to an

opposite end of said link and means for rotating said shaft in a first direction and then in a reverse direction, said means for rotating said shaft in a first direction and then in a reverse direction comprising:

a second link having a first end and an opposite end, said first end of said second link being non-pivotally attached to said shaft;

a rod having a first end and an opposite end, said first end of said rod being pivotally attached to said opposite end of said second link; and

means for reciprocating said rod;

rotatable screw feeding means disposed beneath said storage hopper for receiving solid materials dispensed from said chamber through said restricted opening and for conveying said solid materials away from said storage hopper by the rotation of said rotatable screw feeding means;

means for rotating said rotatable screw feeding means; and

said means for reciprocating said rod comprising a cam bearing, said cam bearing being rotatable with said rotatable screw feeding means, said opposite end of said rod being attached to said cam bearing.

4,691,847

PASTY PRODUCT DISPENSER HAVING COMBINATION ACTUATOR AND OUTLET VALVE

John M. B. Ford, and David G. Moore, both of Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Dec. 27, 1983, Ser. No. 565,540
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—259 **5 Claims**

1. A dispenser for pasty products comprising:

a tubular body;

a discharge spout at one end of the body having an outlet;

a floating take-up piston at the opposite end of the body movable toward said spout by atmospheric pressure against the underside of the piston but having anti-reverse means associated therewith preventing movement away from the spout;

a reciprocable pumping piston contained within the body adjacent said one end and cooperating with said floating piston to define a pumping chamber therebetween,

said pumping piston having a passage therethrough communicating said chamber with the outlet of the spout,

said passage being continuously open along the entire length thereof from said pumping chamber to said outlet of the spout;

a depressible actuator operably coupled with said pumping piston for shifting the latter through a pumping stroke toward the floating piston when the actuator is depressed;

resilient means for returning the actuator to its undepressed position and the pumping piston to its unshifted position following each pumping stroke of the pumping piston; and

an external check valve integral with said actuator and movable therewith during said depression and return thereof,

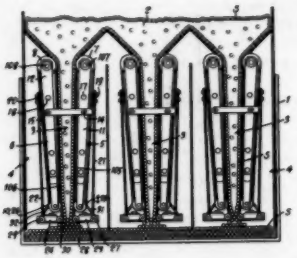
said valve being disposed to open and uncover said outlet when the actuator is depressed and to cover and close the outlet from outside of the spout when the actuator is in its undepressed position, whereby to prevent suck-back of product in the spout when the valve is closed before subatmospheric pressure in the body from the retracted pumping piston and dispensed volume of product has drawn product back through the spout.

4,691,848

DEVICE FOR FEEDING CIGARETTES OR THE LIKE ROD-LIKE ARTICLES

Goffredo Gianese, Bologna, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Dec. 3, 1984, Ser. No. 677,352
Claims priority, application Italy, Dec. 9, 1983, 12691 A/83
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—269 **18 Claims**



1. A device for feeding rod-like articles to a receptacle, comprising:

a downwardly extending article-guiding channel, having opposite sides and having a lower end with a mouth that has opposite sides, through which horizontally disposed articles descend as a mass flow, and are delivered from the mouth to the receptacle; and

interruption means fior interrupting at will the descent of the articles through the channel, said interruption means including

two endless conveyor members,

mounting means for movably mounting the conveyor members in an oppositely arranged relation so that the conveyor members delimit the sides of the mouth of the channel and so that both conveyor members are shiftable, the conveyor members being shiftable from a mouth-closing position in which they are drawn near to each other so as to close the mouth of the channel and hinder the articles from flowing out therefrom, into a mouth-opening position in which they are drawn away from each other so as to open the mouth of the channel and allow the articles to flow out therefrom,

urging means, cooperating with the mounting means, for urging the conveyor members toward one another, so that they tend to move into the mouth-closing position, and

driving means for applying a driving force to the articles in the channel to thrust the articles toward the receptacle, the thrust of the articles tending to spread the conveyor members so that they move into their mouth-opening position, the driving force being additional to the force of gravity and to the pressure applied by any overlying articles in the channel and being selectively reducible, annullable, and reversible to decrease the

thrust applied by the articles on the conveyor members so that the urging means is allowed to move them into the mouth-closing position,

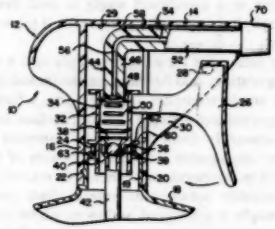
wherein the mounting means comprises two support members, each conveyor member being mounted on a respective support member, and wherein the urging means comprises means for swingably mounting the support members in an out-of-balance condition, such that they tend to move by gravity into a position corresponding to the mouth-closing position of the respective endless conveyor members.

4,691,849

MANUALLY OPERATED TRIGGER TYPE DISPENSER

Atsushi Tada, 2-6-3 Kakinokizaka, Meguro-ku, Tokyo 152, Japan

Filed Dec. 5, 1985, Ser. No. 805,272
Int. Cl.[4] B67D *5/40*; B05B *9/043*
U.S. Cl. 222—382 **9 Claims**



1. A manually operated trigger type dispenser comprising:

a dispenser body adapted to be detachably mounted onto a neck of a container containing liquid to be dispensed, said dispenser body being molded of plastic material and including an upper body portion on which a trigger is swingably pivoted and a vertically extending lower tubular portion,

a tube formed separately from the dispenser body in an L-shape having a horizontal portion thereof disposed in the upper body portion and a vertical portion thereof disposed in the vertically extending lower tubular portion, the lower end of said vertical portion having a piston disposed thereon,

a cylinder defining a pump chamber, coupled to the trigger and disposed in the lower tubular portion to reciprocate along the piston between its upper operation position and its lower non-operation position,

inlet conduit means formed in the cylinder and communicating with the pump chamber to enable flow of liquid therethrough from the container to the pump chamber,

nozzle means mounted on the terminal end of the horizontal portion of said tube and including an orifice,

outlet conduit means formed in the horizontal portion of said tube, and communicating with the pump chamber to dispense compressed liquid from the pump chamber through said orifice, and

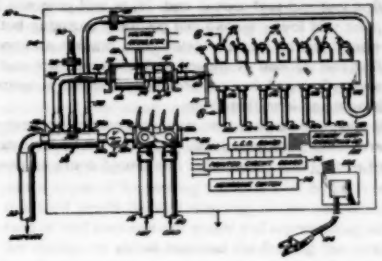
means for biasing the cylinder to its lower non-operation position.

4,691,850

CHEMICAL DISPENSING SYSTEM

John D. Kirschmann, 933 Anderson St., Bismarck, N. Dak. 58501, and John P. Soberg, 1280 W. Larpenteur Ave., St. Paul, Minn. 55113

Filed Aug. 9, 1984, Ser. No. 639,248
Int. Cl.[4] G04C *23/00*
U.S. Cl. 222—642 **20 Claims**



1. A system for mixing chemical solutions comprising:

a distribution manifold comprising:

a main passage;

a plurality of inlet ports connected to said passage;

an outlet connected to said passage; and

a flush port, said flush port being operatively connected to a supply of flush fluid;

a pump having an inlet and an outlet, said pump inlet being connected to said manifold outlet to draw solutions through said manifold and said pump;

selectively controllable valve means associated with at least one of said ports; and

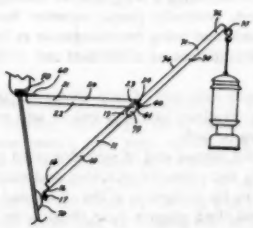
an outlet manifold comprising an inlet connected to a source of pressurized flush fluid, a flush outlet from said manifold connected in fluid flow communication to said flush port, a dispensing outlet, and a fluid inlet connected to said pump outlet to receive fluid discharged by said pump.

4,691,851

APPARATUS FOR HANGING ITEMS FROM VEHICLES

Gordon V. Asserude, 444 La Paloma, El Sobrante, Calif. 94803

Filed Jun. 12, 1986, Ser. No. 874,284
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—42.45 R **4 Claims**



1. An apparatus for hanging an item from a vehicle comprising:

(A) an elongated rigid bracket arm having a first end, a second end and a central portion connecting said first and second ends; (1) said first end having a means for attaching said bracket arm removably rigidly into an upper window channel of said vehicle when the window is closed (2) said second end possessing proximate its end remote from said central portion a common hinge point;

(B) an elongated rigid support arm having an upper first end,

a lower second end and a central portion connecting said first end and said second end; (3) said lower second end having means for resiliently contacting the window of the vehicle and said first end pivotally engaging the second end of said elongated rigid bracket arm at the common hinge point;

(C) an elongated extension arm having an upper first end, a lower second end and a central portion connecting said first end and said second end; (4) at said common hinge point said lower second end pivotally engaging both the second end of said elongated rigid bracket arm and the first end of said elongated rigid support arm and said upper first end having proximate thereto a means for hanging an item therefrom;

(D) said rigid bracket arm, rigid support arm and extension arm share a common hinge point and are foldable capable of nesting one in the other in a nested configuration.

4,691,852

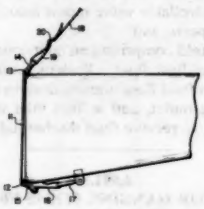
GUN SLING

Warren C. Phelps, Rte. 2, Sidney, Nebr. 69162

Filed Oct. 21, 1983, Ser. No. 544,262

Int. Cl.[4] F41C *33/00*

U.S. Cl. 224—150 **7 Claims**



1. In combination with a firearm having a stock with a butt end and a sling strap or web for carrying said firearm, the improvement comprising a sling adapter having:

an elongated, generally planar member having first and second ends and being commensurate in length with the longitudinal dimension of the butt end of the stock of the firearm;

means at said first end of said elongated planar member rotatably attaching said first end of said member to said sling strap or web;

means at said second end of said elongated planar member releasably and rotatably attaching said second end of said member to the underside of the stock; and

wherein said sling adapter is so constructed and arranged with respect to the butt end of said firearm that (1) the firearm can be carried in a substantially horizontal stable position while suspended from a shoulder of the bearer of the firearm in position for firing, (2) when tension is removed from said sling strap web by lifting said firearm to a conventional firing position, said sling planar member pivots downwardly and away from said butt end of the stock and said stock is unhindered by the sling and said firearm may be readily aimed without interference, and (3) the generally planar nature of said adapter allows said sling strap or web to be positioned in a tight sling position for tight sling firing.

4,691,853

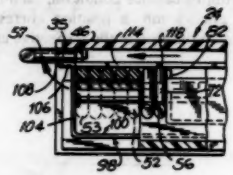
SURGICAL STAPLER

Anthony Storace, Norwalk, Conn., assignor to Technalytics, Inc., Montvale, N.J.

Filed Dec. 30, 1985, Ser. No. 814,666

Int. Cl.[4] A61B *17/00*

U.S. Cl. 227—19 **41 Claims**



1. A stapling device for use in ejecting a single staple to close an incision or wound comprising:

a barrel having a bottom and a top side and a staple discharge area,

a cartridge assembly adapted to receive a plurality of staples in the form of a stack disposed wihtin said barrel,

a pusher assembly engageable with said stack of staples and movable between a first rearward position and a second forward position to advance said stack of staples,

a control means for turning a single staple of the stack of staples to be ejected from a first position to a second position at a significant angle to said first position at a vertical plane other than the vertical plane of the stack of staples,

forming means for forming the staple into a closed gripping configuration, said forming means including an anvil having a staple transport surface upon which said staple is transported and a staple forming surface extending generally upwardly from said staple transport surface; and a former engageable with the cross-arm of the staple to be ejected to cooperate with means to restrain said staple and displaceable between an intermediate position wherein said staple is unformed and in its plane of ejection and a final position wherein said staple is formed within the incision in a closed gripping configuration, and

stripping means for disengaging the staple to be ejected from said device and to eject the fully formed staple.

4,691,854

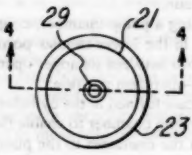
COATINGS FOR CERAMIC BONDING CAPILLARIES

James F. Haefling, Richardson; James W. Pritchard, Garland, and Roger J. Stierman, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1984, Ser. No. 684,654

Int. Cl.[4] B23K *37/00*

U.S. Cl. 228—4.5 **10 Claims**



1. An apparatus for bonding a wire to interconnect first and second metalized surfaces comprising:

a ceramic non-conductive capillary means for passing a first end of wire from a supply of wire, wherein the capillary means includes a pressure bearing surface and an inner guide passage with an inner surface;

an oxide of silicon, or an oxide of aluminum, non-conducting coating on the pressure bearing surface and on the inner surface of the inner guide passage in the region near the pressure bearing surface;

forming means for forming a ball on the first end of the wire;

retracting means for retracting the ball to a first end of the capillary means;

heating means for heating the ball, first surface, and second surface to a bonding temperature;

stitching means for forming a stitch of wire from the first metalized surface to the second metalized surface and to bond the wire thereto;

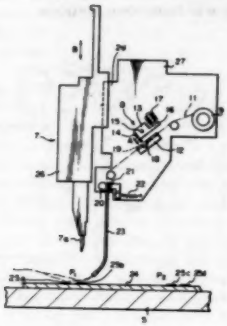
wherein the layer of an oxide of silicon, or an oxide of aluminum, is for resisting the collection of metal splatter, on the surfaces of the capillary means in the region near the pressure bearing surface, resulting from the forming of the ball on the first end of the wire by drawing an arc to the first end of the wire.

4,691,855

TWIN WIRE SPLITTER SYSTEM

Harumi Yagi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 30, 1985, Ser. No. 814,257
Int. Cl.[4] H05K *13/06*
U.S. Cl. 228—4.5 **5 Claims**



1. A twin wire splitter system comprising:

an X-Y table for mounting a printed circuit board thereon;

wire bonding means for continuously bonding a twin wire to a plurality of wire connecting positions on said printed circuit board;

means defining a twin wire feeding path;

feeding means for feeding the twin wire along said twin wire feeding path;

splitting means for selectively splitting the twin wire at predetermined, relatively displaced splitting positions therein;

said wire splitting means and said wire bonding means being disposed at corresponding splitting and bonding postions of said twin wire feeding path displaced by a first predtermined distance;

a splitting operation controlling means for controlling the start and the end of each twin wire splitting operation carried out by said splitting means as a function of said first predetermined distance along said twin wire feeding path between said bonding position of said wire bonding means and said splitting position of said splitting means, the split length of one split portion of the twin wire, and the length of said twin wire to be fed for each successive bonding operation corresponding to a sequence of positions to be interconnected by said twin wire on said printed circuit board;

said feeding means comprising a stepping motor and a counter circuit connected to said splitting operation controlling means to detect the length of the twin wire which is fed and for driving said stepping motor in accordance with successive pulses; and

said splitting operation controlling means comprises:

a central processing unit for calculating the start and end points of each split portion in the twin wire, required for and associated with each feed of the twin wire;

a split start buffer circuit and a split end buffer circuit for storing results of the start and end point calculations performed by said central processing unit;

a split start point comparator circuit and a split end point comparator circuit for comparing outputs of the respective said buffer circuits with an output of said counter circuit and producing respectively corresponding outputs;

a gate circuit for driving said splitting means according to the outputs of said comparator circuits; and

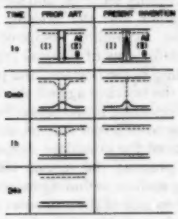
said central processing unit calculating the total number of pulses required for feeding the twin wire by each successive feed length by said stepping motor and calculating each of said start and end points and representing same by the number of pulses required for feeding the remaining length of the twin wire required to be fed, from each of the start and end points to the end of the feed length, by the stepping motor.

4,691,856

DIFFUSION BONDING METHOD USING A HIGH ENERGY BEAM

Takashi Haramaki, Tohkai; Takao Funamoto, Hitachi; Satoshi Kokura, Hitachiohta; Masahisa Inagaki, Hitachi; Ryutaro Jimbou, Hitachiohta; Toshimi Sasaki, Mito, and Kousei Nagayama, Tohkai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 397,048, Jul. 12, 1982, abandoned. This application Jun. 28, 1985, Ser. No. 749,764
Claims priority, application Japan, Jul. 13, 1981, 56-109872
Int. Cl.[4] B23K *19/00*
U.S. Cl. 228—194 **7 Claims**



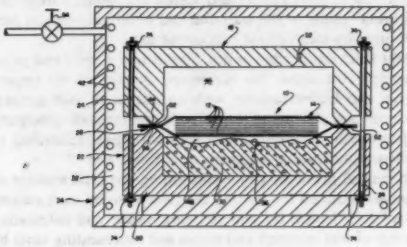
1. A diffusion bonding method comprising: forming, in advance, a low melting alloy layer on at least one of the joint surfaces of base metals, said base metals each comprising a superalloy based on an element selected from the group consisting of Ni, Co, Fe and Ti, said forming of said low melting alloy layer being accomplished by melting which is carried out by a high energy beam used for melting said at least one of the joint surfaces and by incorporating at least one additional element from a material comprising a boron powder and an organic binder, said at least one additional element having a higher diffusion speed than that of the principal constituent element of said base metals, and said low melting alloy layer having a lower melting point than that of said base metals; then bringing the joint surfaces into contact; and heating the joint surfaces of a temperature in the range of the melting point of said alloy layer to that of said base metals in a non-oxidizing atmospheric furnace so as to diffuse said at least on additional element away from said joint surfaces and to bond said metals to each other.

4,691,857

METHOD OF SHAPING A WORKPIECE

Gerald Friedman, Cleveland Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 7, 1985, Ser. No. 796,322
Int. Cl.[4] B23K 20/14
U.S. Cl. 228—265 6 Claims



1. A method of bonding and shaping a plurality of pieces of material, said method comprising the steps of enclosing the plurality of pieces of material in a fluid tight container, providing a housing having a plurality of components at least some of which have different coefficients of thermal expansion, the components of the housing including a first section and a second section having a forming surface, positioning the container and housing relative to each other with the first housing section in engagement with a first side of the container and the second housing section in engagement with a second side of the container to form a joint between the housing sections and the container, enclosing the housing sections and container in a main chamber, increasing the fluid pressure in the main chamber, increasing the fluid pressure applied against opposite sides of the container from a first fluid pressure to a second fluid pressure, said step of increasing the fluid pressure applied against opposite sides of the container including increasing the fluid pressure in the main chamber from the first fluid pressure to the second fluid pressure, sealing the joint between the container and the housing sections, said step of sealing the joint between the container and the housing sections including heating the housing, expanding components of the housing having different coefficients of thermal expansion to different extents during heating of the housing, and pressing the first and second sections of the housing against the container under the influence of forces resulting from thermally expanding components of the housing to different extents, and, thereafter, pressing the second side of the container against the forming surface, said step of pressing the second side of the container against the forming surface including increasing the fluid pressure to which the first side of the container is exposed to a third fluid pressure which is greater than the second fluid pressure by increasing the fluid pressure in the main chamber to the third fluid prssure and maintaining the fluid pressure to which the second side of the container is exposed substantially constant.

4,691,858

MILK CARTON BLANK AND MILK CARTON WITH POUR SPOUT

A. Dean Peer, Jr., Parker, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Jul. 25, 1983, Ser. No. 517,324
Int. Cl.[4] B65D 5/74
U.S. Cl. 206—621.2 6 Claims

1. A carton blank for forming a liquid tight carton comprising:

a unitary sheet of laminated composite material comprising an inner layer of paper material having a first side and a second side; first layer of plastic material bonded to said first side of said paper material by a first adhesive layer; a second layer of plastic material bonded to said second side of said paper material said layers of plastic material and said layer of adhesive being coextensive, said first plastic layer being back printed with predetermined carton display graphics;

said unitary sheet of composite material comprising:

a left side edge, a right side edge, a top edge, and a bottom edge, said left and right side edge being perpendicular to said top and bottom edges;

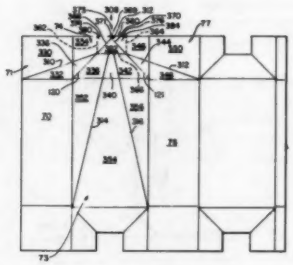
first, second, third and fourth longitudinal fold lines extending from said top edge to said bottom edge in perpendicular relationship thereto;

upper and lower transverse fold lines extending from said left side edge to said right side edge in perpendicular relationship thereto;

said longitudinal fold lines dividing the carton blank into left, front, right, back and edge flap longitudinal portions, said left portion being adjacent said front portion, said front portion being adjacent said right portion, said right portion being adjacent said back portion, said back portion being adjacent said edge flap portion;

said left longitudinal portion being identical in lateral dimension to said right longitudinal portion and said front longitudinal portion being identical in lateral dimension to said back longitudinal portion, said edge flap longitudinal portion being of substantially smaller lateral dimension than said other longitudinal portions;

said transverse fold lines dividing said carton into upper, middle and lower transverse portions;



associated, oppositely positioned upper and lower transverse portions having identical longitudinal dimensions, said longitudinal dimension of associated upper and lower portions being substantially smaller than the longitudinal dimension of an associated middle transverse portion;

said longitudinal and transverse fold lines forming a grid pattern dividing the carton into a left lateral side panel, a left top panel, a left bottom panel, a front lateral side panel, a front top panel, a front bottom panel, a right lateral side panel, a right top panel, a right bottom panel, a back lateral side panel, a back top panel, a back bottom panel, an edge flap lateral side panel, an edge flap top panel, and an edge flap bottom panel;

said front bottom panel, said back top panel and said back bottom panel comprising rectangular cutout portions therein of identical size and shape, each said cutout portion comprising two spaced apart longitudinal cutout edge surfaces extending perpendicularly and inwardly from an associated carton blank transversely extending peripheral edge surface, and a transverse cutout edge surface intersecting said longitudinal cutout edge surfaces in substantially perpendicular relationship therewith at cutout inner corners, said cutout portions being laterally symmetrically positioned within associated panel portions;

diagonal fold lines extending between said cutout corners and adjacent inwardly positioned corner portions of associated panels, said cutout portions being constructed and arranged whereby said diagonal fold lines bisect the an-

gles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of said associated panel portions;

the length of a longitudinal edge surface of a cutout portion being no greater than the length of a transverse edge surface of a cutout portion but greater than one half the length of said cutout portion transverse edge surface;

the perpendicular distance between a cutout transverse edge surface and a transverse fold line bordering an associated panel being at least one half the lateral dimension of said carton blank left longitudinal portion;

said front top panel comprising a rectangular perforated portion therein, said rectangular perforated portion comprising two spaced apart longitudinal perforation lines extending perpendicularly and inwardly from said top edge surface, and transverse perforation lines intersecting said longitudinal perforation lines in substantially perpendicular relationship therewith at perforated portion inner corners, said perforation lines extending through one plastic layer, one adhesive layer and at least a portion of said paper material layer of said laminated composite material whereby said perforation lines are readily tearable, said perforated portion being laterally symmetrically positioned within said top front panel;

diagonal fold lines extending between said perforated portion corners and adjacent inwardly positioned corner portions of said top front panel, said perforated portion being constructed and arranged whereby said diagonal fold lines bisect the angles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of said top front panel portion;

the length of said longitudinal perforation lines being no greater than the length of said transverse perforation line but greater than one half the length of said transverse perforation line;

the perpendicular distance between a cutout transverse perforation line and the transverse fold line bordering said top front panel being at least one half the lateral dimension of said carton blank left longitudinal portion;

pour spout left and right central fold lines extending from opposite lower corner portions of said front lateral side panel to the transverse perforation line of said front top panel perforated portion; said pour spout left and right central fold lines being laterally symmetrically positioned within said front top panel and said front lateral side panel;

pour spout left and right upper fold lines extending respectively from a lower left corner of said left top panel to a lower left corner of said perforation portion and from a lower right corner of said right top panel to a lower right corner of said perforation portion;

perforation portion inner diagonal fold lines extending upwardly and inwardly from said perforation portion lower corners in bisecting relationship therewith and intersecting at a diagonal intersection point;

said perforation portion having a perforation cutout portion defined by left and right upper edge surfaces extending in projecting relationship with said perforation portion diagonal fold lines from said diagonal intersection point to the intersection points of said blank upper edge and said left and right longitudinal perforation lines respectively.

3. A method of utilizing a carton blank of the type including a unitary sheet of laminated composite material comprising an inner layer of paper material having a first side and a second side; a first layer of plastic material bonded to said first side of said paper material by a first adhesive later; a second layer of plastic material bonded to said second side of said paper material;

said unitary sheet of composite material comprising:

a left side edge, a right side edge, a top edge, and a bottom edge, said left and right side edge being perpendicular to said top and bottom edges;

first, second, third and fourth longitudinal fold lines extending from said top edge to said bottom edge in perpendicular relationship thereto;

upper and lower transverse fold lines extending from said left side edge to said right side edge in perpendicular relationship thereto;

said longitudinal fold lines dividing the carton blank into left, front, right, back and edge flap longitudinal portions, said left portion being adjacent said front portion, said front portion being adjacent said right portion, said right portion being adjacent said back portion, said back portion being adjacent said edge flap portion;

said left longitudinal portion being identical in lateral dimension to said right longitudinal portion and said front longitudinal portion being identical in lateral dimension to said back longitudinal portion, said edge flap longitudinal portion being of substantially smaller lateral dimension than said other longitudinal portions;

said transverse fold lines dividing said carton into upper, middle and lower transverse portions;

said longitudinal and transverse fold lines forming a grid pattern dividing the carton into a left lateral side panel, a left top panel, a left bottom panel, a front lateral side panel, a front top panel, a front bottom panel, a right lateral side panel, a right top panel, a right bottom panel, a back lateral side panel, a back top panel, a back bottom panel, and edge flap lateral side panel, and edge flap top panel, and an edge flap bottom panel;

said front bottom panel, said back top panel and said back bottom panel comprising rectangular cutout portions therein of identical size and shape, each said cutout portion comprising two spaced apart longitudinal cutout edge surfaces extending perpendicularly and inwardly from an associated carton blank transversely extending peripheral edge surface and a transverse cutout edge surface, intersecting said longitudinal cutout edge surfaces in substantially perpendicular relationship therewith at cutout inner corners, said cutout portions being laterally symmetrically positioned within associated panel portions;

diagonal fold lines extending between said cutout corners and adjacent longitudinally inwardly positioned corner portions of associated panels, said cutout portions being constructed and arranged whereby said diagonal fold lines bisect the angles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of associated panel portions;

said front top panel comprising a rectangular perforated portion therein, said rectangular perforated portion comprising two spaced apart longitudinal perforation lines extending perpendicularly and inwardly form said top edge surface, and a transverse perforation line intersecting said longitudinal perforation lines in substantially perpendicular relationship therewith at perforated portion inner corners, said perforation lines extending through one plastic layer, one adhesive layer and at least a portion of said paper material layer of said laminated composite material whereby said perforation lines are readily tearable, said perforated portion being laterally symmetrically positioned within said top front panel;

diagonal fold lines extending between said perforated portion corners and adjacent inwardly positioned corner portions of said top front panel, said perforated portion being constructed and arranged whereby said diagonal fold lines bisect the angles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of said top front panel portion;

the perpendicular distance between a cutout transverse perforation line and said upper transverse fold line being at least one half the lateral dimension of said carton blank left longitudinal portion;

pour spout left and right central fold lines extending from opposite lower corner portions of said front lateral side panel to the transverse perforation line of said front top panel perforated portion; said pour spout left and right central fold lines being laterally symmetrically positioned within said front top panel and said front lateral side panel;

pour spout left and right upper fold lines extending respec-

tively from a lower left corner of said left top panel to a lower left corner of said perforation portion and from a lower right corner of said right top panel to a lower right corner of said perforation portion;

perforation portion inner diagonal fold lines extending upwardly and inwardly from said perforation portion lower corners in bisecting relationship therewith and intersecting at a diagonal intersection point; comprising the steps of:

(a) folding each said longitudinal carton blank portions into perpendicular relationship with an adjacent longitudinal portion so as to provide a rectangular, tubular configuration with said edge flap longitudinal portion in overlapping relationship with said left longitudinal portion;

(b) sealingly affixing said overlapping portions along a sealing area extending the longitudinal length of said carton;

(c) folding said upper and lower transverse carton portion into perpendicular relationship with said middle transverse portion so as to enclose an upper end and lower end of said tubular configuration by overlapping upper panel portions and overlapping lower panel portions respectively and so as to provide a pair of outwardly projecting multilayered tongues at each said upper and lower end of said tubular configuration;

(d) sealingly affixing said overlapping portions of said upper portions and said lower portions along a sealing area extending between outer most positions on each upper and lower pair of tongues;

(e) folding each pair of tongues inwardly with a tongue comprising said perforated portion positioned outwardly of the associated tongue;

(f) affixing said tongues in said inwardly folded relationship whereby a sealed carton of regular parallelepiped configuration is provided.

4,691,859

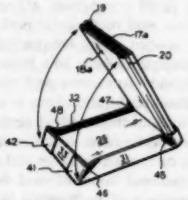
COLLAPSIBLE BULK SHIPPING CONTAINER

Teddy R. Snyder, Maumee, Ohio, assignor to OI Forest Products STS Inc., Toledo, Ohio

Filed May 5, 1986, Ser. No. 859,957

Int. Cl.[4] B65D *5/36*

U.S. Cl. 229—23 R **21 Claims**



1. A collapsible bulk shipping container comprising:

a tray-type bottom, said tray-type bottom having:

a rectangular bottom panel, said rectangular bottom panel having first and second opposed, spaced-apart short edges and first and second opposed, spaced-apart long edges, said first and second opposed, spaced-apart long edges extending transversely between said first and second opposed, spaced-apart short edges;

first and second long panel means, one of said first and second long panel means being foldably attached to one of said first and second opposed, spaced-apart long edges of said rectangular bottom panel, at least a portion of said one of said first and second long panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said one of said first and second long panel means extends generally parallel to said rectangular bottom panel to a second position in which said at least a portion of said one of said first and second long panel means extends generally normally from said rectangular bottom panel, at least a portion of the other of said first and second long panel means being foldably attached to the other of said first and second opposed, spaced-apart long edges of said rectangular bottom panel, said at least a portion of said other of said first and second long panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said other of said first and second long panel means extends generally parallel to said rectangular bottom panel to a second position in which said at least a portion of said other of said first and second long panel means extends generally normally from said rectangular bottom panel;

first and second short panel means, one of said first and second short panel means being foldably attached to one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel, said one of said first and second short panel means being foldable, with respect to said rectangular bottom panel, from a first position in which said one of said first and second short panel means extends generally parallel to said rectangular bottom panel to a second position in which said one of said first and second short panel means extends generally normally from said rectangular bottom panel, the other of said first and second short panel means being foldably attached to the other of said first and second opposed, spaced-apart short edges of said rectangular bottom panel; and

an intermediate panel, said intermediate panel being directly foldably attached to said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel, said one of said first and second short panel means being foldably attached to said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel by being foldably attached to said intermediate panel, said one of said first and second short panel means being foldably attached to said intermediate panel along a fold line which is spaced from and which extends generally parallel to said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel; and

a collapsible tubular structure which is partially telescopically disposed within said tray-type bottom and which is collapsible from a first, open configuration in which said collapsible tubular structure has a generally rectangular configuration to a second, collapsed configuration, said collapsible tubular structure extending generally normally from said rectangular bottom panel of said tray-type bottom when said collapsible tubular structure is in said first, open configuration and in which said collapsible tubular structure, when in said second, collapsed configuration, is foldable with respect to said tray-type bottom to extend generally parallel to said rectangular bottom panel, the space between said fold line of said tray-type bottom and said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel of said tray-type bottom being substantially at least as great as the thickness of said collapsible tubular structure in its second collapsed configuration so that said collapsible tubular structure when in its second, collapsed configuration, will be contained within the outline of said intermediate panel, said collapsible tubular structure having;

first and second opposed short sides, one of said first and second opposed short sides of said collapsible tubular structure being disposed adjacent to, and being substantially coextensive with, one of said first and second short panel means of said tray-type bottom, said one of said first and second opposed short sides being secured to said one of said first and second short panel means of said tray-type bottom, the other of said first and second opposed short sides being disposed adjacent to, and being substantially coextensive with, the other of said first and second short panel means of said tray-type bottom, when said collapsible tubular structure is in said first, open configuration, said other of said first and second opposed short sides

being movable away from said other of said first and second short panel means of said tray-type bottom and toward said one of said first and second opposed short sides upon the collapsing of said collapsible tubular structure into said second, collapsed configuration; and

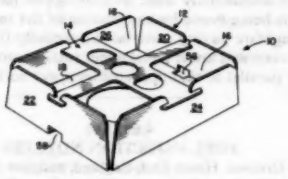
first and second opposed long sides, each of said first and second opposed long sides being foldably attached to and extending between each of said first and second opposed short sides, one of said first and second opposed long sides being disposed adjacent to and being substantially coextensive with one of said first and second long panel means of said tray-type bottom when said collapsible tubular structure is in said first, open configuration, the other of said first and second opposed long sides being disposed adjacent to and being substantially coextensive with the other of said first and second long panel means of said tray-type bottom when said collapsible tubular structure is in said first, open configuration, each of said first and second opposed long sides further having vertical fold line means therein to permit said each of said first and second opposed long sides to be folded inwardly about said vertical fold line means toward the other of said first and second opposed long sides upon the collapsing of said collapsible tubular structure into said second, collapsed configuration.

4,691,860

FOLDABLE CONTAINER CARRIER COLLAPSIBLE CONTAINER CARRIER WITH CRUCIFORM HANDLE

Mindaugas J. Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 15, 1986, Ser. No. 941,229
Int. Cl.[4] B65D *5/46*
U.S. Cl. 229—52 A **7 Claims**



1. A two-piece foldable container carrier comprising:

a base member having first and second pairs of opposing sidewall panels which divide said base member into a central base panel between four foldable sidewall panels, each of said sidewall panels having a slot formed in its distal end opposite said central base panel;

a handle member having a generally cruciform shape formed by arm members which extend a distance corresponding to the dimensions of said central base panel for sliding engagement with said slots of said sidewall panels, and

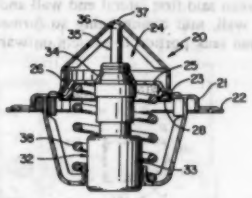
retention means integral with distal ends of said arm members for retaining said arm members within said slots whereby said sidewalls are relatively perpendicular to said central base panel when in use and are folded inwardly to a relatively flat position for storage and said retention means is capable of restricting said sidewall panels from folding outwardly when said sidewalls are perpendicular to said central base while being capable of permitting said sidewall panels to fold inwardly to a relatively flat position while slidingly engaging said arm members of said handle member.

4,691,861

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, and Joseph P. Wagner, Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 791,378, Oct. 25, 1985, Pat. No. 4,630,770. This application Aug. 26, 1986, Ser. No. 900,439
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[4] F16K *51/00, 1/00*
U.S. Cl. 236—34.5 **6 Claims**



1. In a valve construction having an annular valve seat means and a movable valve member for opening and closing said valve seat means and being operatively interconnected to a thermal power element that is carried by said valve construction, said valve member having an annular rigid part for engaging said valve seat means and having an annular flexible part for also engaging said valve seat means at a point upstream of said rigid part, said parts of said valve member being so constructed and arranged that said rigid part moves out of engagement with and away from said valve seat means a certain distance before said flexible part moves out of engagement with said valve seat means, said flexible part of said valve member having an annular peripheral outer edge means that extends outwardly beyond said rigid part, said rigid part having an annular peripheral outer edge means provided with an outer end surface that is adapted to engage said valve seat means and is disposed radially inwardly in spaced relation to said outer end surface of said flexible part, the improvement wherein said rigid part of said valve member has first opening means therethrough and said flexible part of said valve member has second opening means therethrough said first and second opening means being adapted to provide a certain sized fluid flow path through said flexible part of said valve member when said rigid part of said valve member is engaging said valve seat means and is adapted to provide a larger certain sized fluid flow path therethrough when said end surface of said rigid part of said valve member has moved out of engagement with said valve seat means and said flexible part of said valve member is still in engagement with said valve seat means.

4,691,862

HEATER UNIT FOR VEHICLES

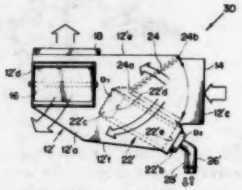
Yoshihiko Muto; Toshio Ohashi, both of Atsugi, and Tsunenari Adachi, Tochigi, all of Japan, assignors to Nissan Motor Co., Ltd. and Nihon Radiator Co., Ltd., both of, Japan

Filed May 30, 1986, Ser. No. 868,555
Claims priority, application Japan, Jun. 6, 1985, 60-121484
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 A **6 Claims**

1. A heater unit for a vehicle, said heater unit comprising:

a casing having a box-like shape and including a pair of top and bottom end walls, a pair of opposed first and second lateral end walls, and a pair of opposed third and fourth lateral end walls, said first lateral end wall being formed with an air inlet while said top end wall, third lateral end wall, and said bottom end wall are each respectively formed with an air outlet, air entering said casing in one direction through said inlet and flowing through said casing to said outlets;

a heater core disposed within said casing for heating air passing therethrough, said heater core having a rectangular heater core main body portion which is disposed vertically to extend between said top and bottom end walls in such a manner as to have a pair of opposed inner and outer lateral ends the outer one of which is positioned adjacent said fourth lateral end wall and the inner one of which is positioned between said third and fourth lateral end walls, said heater core having a first tank portion attached to said inner lateral end of said heater core main body portion and a second tank portion attached to said outer lateral end of said heater core main body portion, said second tank portion being disposed in a corner portion of said casing between said first lateral end wall and said fourth lateral end wall, said casing being so formed as to allow said second tank portion to project outward therefrom; and



an air mix door disposed within said casing and having a pivotal end about which it is swingable for controlling the amount of air passing through said heater core and the amount of air bypassing the same, said pivotal end of said air mix door being located adjacent said inner lateral end of said heater core main body portion such that said first tank portion is disposed adjacently behind said pivotal end of said air mix door with respect to the direction of air flow, said air mix door having another end which is opposite to said pivotal end and movable between said outer lateral end of said heater core main body portion and said third lateral end wall of said casing,

said heater core further comprising a pair of inlet and outlet pipes attached to said second tank portion for supply and discharge of heating medium to and from said second tank portion.

4,691,863

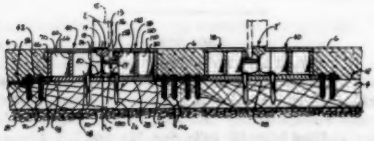
RAILROAD GRADE CROSSING STRUCTURE

Gene M. Smith, 4602 Beauchamp Rd., Plant City, Fla. 33566

Filed May 15, 1986, Ser. No. 863,687

Int. Cl.[4] E01B *2/00*

U.S. Cl. 238—8 **10 Claims**



1. A railroad grade crossing structure for use with a paved thoroughfare and a rail roadway having a roadbed, a series of elongated, spaced apart crossties having a lower surface resting upon the roadbed and an upper surface facing away from the roadbed, and a pair of rails overlying and supported by said crossties, each said rail having a wheel supporting track with an upper surface facing away from said crossties, an inside surface facing toward the other said rail and an outside surface facing away from said other rail, a pair of opposed, lower laterally projecting flanges and a supporting web extending in the center of said rail between said track and said flanges, said grade crossing structure comprising

a metal rail support plate interposed between each said rail and each said crosstie underlying said grade crossing structure, and rail support plate having a substantially flat and horizontal upward facing surface extending outwardly from each said rail flange to an outer edge located a distance equal to at least twice the width of said flange measured from the center of each said rail;

decking structure for each said rail, said decking structure comprising an inner decking element positioned adjacent and extending along said rail track inside surface of one of said pair of rails and an outer decking element positioned adjacent and extending along said rail track outer surface of said one rail;

each said decking element being formed of substantially rigid metal plate members and comprising a structure having a generally z-shaped cross section and comprising a lower panel and upper panel generally parallel thereto and joined together by a connector panel;

said lower panel being attached to the upper surface of a plurality of said crossties and having a lower surface extending generally parallel to and engaging said upper surfaces of said crossties and an upper surface facing away from said crossties, with a first edge of said lower panel adjacent said connector panel and extending generally parallel to and in abutting engagement with said outer edges of a plurality of said rail support plates such that the combination of said affixation to said crossties and said rail support plate engagement will serve to hold said decking structure rigidly in place relative to said rails;

said upper panel having a first edge adjacent said connector panel and a second edge spaced from said first edge and having both an upper surface extending generally coplaner with said rail track upper surface and also a lower surface facing said rail support plate, with an upper panel support structure extending between and engaging said upper panel lower surface and said rail support plate, while remaining free of engagement with said rail flanges and said rail supporting web, for carrying loads imposed downwardly upon said upper panel to said rail support plate, whereby at least a portion of any downward loads imposed upon the upper panel is carried by the rail support plate and a crossstie bearing the rail support plate with substantially none of such upper panel downward loads being borne by any portion of the rail; and

thoroughfare paving material substantially filling the space between said lower panel upper surface and a plane generally parallel to said upper panel upper surface.

4,691,864

FUEL INJECTION NOZZLES

Godfrey Greeves, Hatch End, England, assignor to Lucas Industries public limited company, Birmingham, England

Division of Ser. No. 550,098, Nov. 9, 1983, abandoned. This application Jan. 17, 1986, Ser. No. 799,868

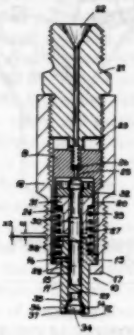
Claims priority, application United Kingdom, Nov. 25, 1982, 8233641

Int. Cl.[4] B05B *1/32*

U.S. Cl. 239—453 **4 Claims**

1. A fuel injection nozzle for supplying fuel to an internal combustion engine, the nozzle being of the so-called outwardly opening type and comprising a valve assembly including a body defining an outlet opening, a bore in the body extending into the outlet opening, a valve member including a stem in the bore, a valve head carried by the stem, said head being located in said outlet opening and being shaped for co-operation with a seating defined at the entrance to the bore from the opening, resilient means acting on the valve member for biasing the head into contact with the seating, a fuel inlet to said bore, the nozzle including a nozzle inlet connected to said fuel inlet, the nozzle inlet in use being connected to the outlet of a high pressure fuel supplying device, said valve member controlling the flow of fuel from said nozzle inlet through said outlet opening, a chamber, part of the wall of which is defined by the valve stem, the free volume of the chamber increasing as the

valve head moves away from the seating, a groove or passage formed in a part of said stem through which said chamber is connected to said nozzle inlet, said part of said stem having the same diameter as the bore, the portion of the stem between said part and the valve head defining a clearance with the bore, the clearance communicating with said nozzle inlet, said groove or passage communicating with said clearance and extending beyond an end of said bore to communicate with said chamber



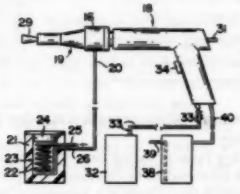
in the closed position of the valve member, the wall of the bore obturating said groove or passage during the movement of the valve member to the open position so that said groove or passage is closed after a predetermined movement of the valve head away from said seating, continued movement of the valve head away from the seating after said groove or passage has closed causing a reduction in the pressure in said chamber, thereby creating a restraining force on said valve member additional to the force exerted by said resilient means.

4,691,865

DEVICE FOR CHILLING STREAM OF GAS-SUSPENDED PARTICLES

Reinhold Hoffman, Sprockhovel, and Walter Klimke, Dusseldorf, both of Fed. Rep. of Germany, assignors to Interlock Corporation, Cleveland, Ohio

Filed Jan. 23, 1986, Ser. No. 821,801
Int. Cl.[4] B05B *1/34, 5/02*
U.S. Cl. 239—690 **12 Claims**



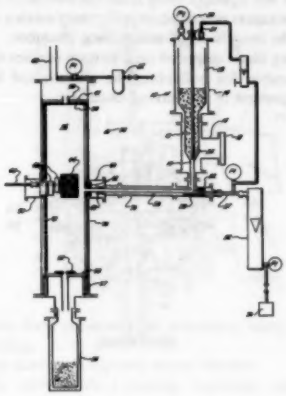
1. A device capable of being handheld and capable of being held in a relatively horizontal position for the chilling of a gas stream containing particles suspended therein comprising a nozzle having (a) a passageway extending linearly therethrough, a first end of said passageway comprising the end through which said gas stream having particles therein is admitted to said passageway, the other end of said passageway comprising the end through which said stream exits from said passageway, (b) a cooling means for chilling gas, (c) a source of gas to be chilled, (d) a source of a gas stream containing particles, and (e) an inlet channel for admitting a chilled gas to the interior of said nozzle connecting and communicating with said passageway whereby the chilled gas admitted through said inlet channel intermingles with the gas suspension passing through said passageway and out.

4,691,866

GENERATION OF SEED PARTICLES

Thomas J. Belk, St. Louis, Mo., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 8, 1985, Ser. No. 796,190
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—5 **14 Claims**



1. A method of generating silicon seed particles, said method comprising the steps of:

dispensing silicon feed particles of about 300–2000 microns from a feed particle vessel into a stream of inert gas moving at a rate sufficient to accelerate and propel said feed particles from said vessel;

directing said stream of inert gas into a target chamber containing a disc-shaped, movable silicon target and impacting the feed particles entrained in said stream into said movable silicon target thereby splitting said feed particles and forming seed particles of about 88–400 microns;

rotatably moving said movable silicon target so that said feed particles in said stream impact on a different portion of said silicon target; and

collecting said silicon seed particles.

4,691,867

METHOD AND APPARATUS FOR CONTINUOUSLY MIXING AND KNEADING PULVERULENT BODIES SUCH AS PULVERIZED COAL, OIL COKE TO PREPARE SLURRY THEREOF

Motonari Iwako, and Masaaki Nakao, both of Tokyo, Japan, assignors to Kabushiki Kaisha Hunken, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 821,917
Int. Cl.[4] B02C *23/40*
U.S. Cl. 241—21 **4 Claims**

1. A continuously mixing and kneading apparatus for preparing slurry of pulverulent bodies comprising:

a mixing chamber having a center axis, covered with a base plate;

a supply tube for connection to a fixed rate supply of pulverulent bodies, having an outlet opening axially into said mixing chamber through said base plate;

a rotary mixing disk rotatably disposed in the mixing chamber for rotation about said center axis to spatter and disperse the pulverulent bodies supplied thereonto from the supply tube;

an overflow tube of inverse conical type surrounding in

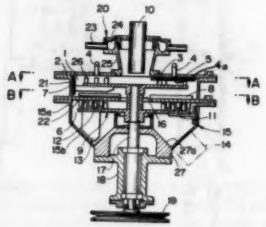
radially outwardly spaced relation said outlet of the supply tube, said tube being disposed on an upper central portion of the mixing chamber for directing a main liquid as an annular overflow film to the spattered and dispersed pulverulent bodies on the rotary mixing disk;

a plurality of injection nozzles having outlets opening into the mixing chamber for injecting a small amount of liquid to the spattered and dispersed pulverulent bodies;

a plurality of upper surface scrapers provided on said rotary mixing disk and disposed to cross the outlet ports of said injection nozzles as the rotary mixing disk rotates so as to disperse the liquid flowing from the outlets of the nozzles;

side face scrapers provided on said rotary mixing disk to turn along the inner wall of said mixing chamber;

a collecting blade disposed on a bottom surface of said mixing chamber for collecting the pulverulent bodies to a center portion of the mixing chamber;



a mixing and kneading chamber provided below said mixing chamber;

means for directing the pulverent bodies from the center portion of the mixing chamber to a center portion of the mixing and kneading chamber;

a rotary mixing and kneading disk rotatably disposed in the mixing and kneading chamber for dispersing centrifugally the humidified pulverulent bodies supplied from said mixing chamber;

fixed mixing and kneading pins secured to an upper wall of the mixing and kneading chamber;

movable mixing and kneading pins planted in said rotary mixing and kneading disk; and

a mixing and kneading type scraper blade provided on said rotary mixing and kneading disk for discharging the mixed and kneaded pulverulent bodies to a discharge port.

4,691,868

SCREEN SIZER

Gilbert Y. Whitten, Jr., Charlotte; Kenneth E. Joyner, Jr., Midland, and Benjamin E. Boren, Charlotte, all of N.C., assignors to Midrex International, B.V., Zurich, Switzerland

Filed Feb. 18, 1986, Ser. No. 830,437

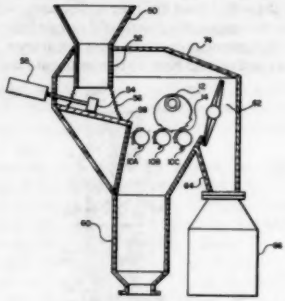
Int. Cl.[4] B02L *73/08*

U.S. Cl. 241—24 **20 Claims**

1. Apparatus for classifying and breaking clumps of material, comprising:

a plurality of rolls having parallel axes, mounted for simultaneous reciprocal rotation, each roll being rotatable at the same speed and in the same direction simultaneously;

each roll being provided with a plurality of equi-spaced breaker and carrier anvils extending from about 80° to about 120° about the circumference of the roll, each of



said anvils being spaced from each adjacent anvil a distance equal to its own width.

4,691,869

APPARATUS FOR CONTROLLING THE OPERATION OF A GRINDING SYSTEM

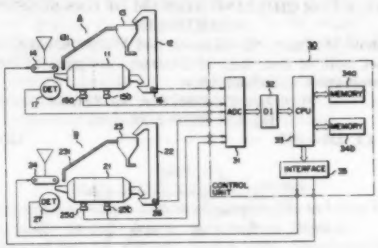
Eiichi Onuma, Narashino; Youji Kawamura, Tsukumi; Hiroshi Obana, Narashino; Takemi Aizawa, Funabashi; Motomi Tamai, Tsukumi; Tsuguya Inagaki, Yokohama, and Minoru Tokita, Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Yamaguchi and Sankyo Dengyo Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 610,622, May 16, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 888,626

Claims priority, application Japan, May 23, 1983, 58-90484

Int. Cl.[4] B02C *25/00*

U.S. Cl. 241—34 **7 Claims**



1. Apparatus for controlling operation of a dry type grinding system, comprising:

at least a first dry type grinding mill and a second dry type grinding mill arranged to be operated in a parallel fashion;

first material supplying means for supplying material to be pulverized to the first mill, and second material supplying means for supplying material to be pulverized to the second mill;

first detecting means for detecting a first characteristic value of a physical quantity corresponding to an amount of material pulverized per unit time in the first mill, and second detecting means for detecting a second characteristic value of a physical quantity corresponding to an amount of material pulverized per unit time in the second mill, wherein said characteristic values vary according to operation conditions of the first and the second mills;

first memory means for storing a first initial setting value of a physical quantity corresponding to an amount of material desired to be pulverized per unit time in the first mill, and second memory means for storing a second initial

setting value of a physical quantity corresponding to an amount of material desired to be pulverized per unit time in the second mill;

first control means for performing a predetermined computation between the initial setting value stored in the first memory means and the characteristic value detected by the first detecting means, and for performing a predetermined computation between the initial setting value stored in the second memory means and the characteristic value detected by the second detecting means, and for producing a first control signal for controlling amounts of material supplied from the first and the second material supplying means so that the first setting value coincides with the first characteristic value, and so that the second setting value coincides with the second characteristic value;

first calculating means for calculating an amount of material pulverized in the first mill per unit time according to the characteristic value detected by the first detecting means, and for calculating an amount of material pulverized in the second mill per unit time according to the characteristic value detected by the second detecting means;

second calculating means for calculating a difference between the amount of material pulverized in the first mill per said unit time and the amount of material pulverized in the second mill per said unit time as calculated by the first calculating means;

third calculating means, associated with said second calculating means, for calculating an amount of variation between said difference between the amounts of material pulverized for a previous said unit time prior to a present said unit time as calculated by said second calculating means, and the difference between the amounts of material pulverized for the present said unit time as calculated by said second calculating means;

means for judging if the amount of variation calculated by the third calculating means is greater or smaller than a predetermined value;

second control means for producing a second control signal which, when said amount of variation is judged by the judging means as being greater than the predetermined value, causes only the initial setting value stored in one of the first and the second memory means to be changed so that the difference between the amounts of material pulverized in the first mill and the second mill as calculated at a next said unit time following the present said unit time by the second calculating means is greater than that at the present said unit time, and so that the amounts of material supplied by the first and the second material supplying means are selectively controlled; and

third control means for producing a third control signal which, when said amount of variation is judged by the judging means as being smaller than the predetermined value, causes only the initial setting value stored in the other of the first and the second memory means to be changed so that the difference between the amounts of material pulverized in the first mill and the second mill as calculated at the next said unit time by the second calculating means is greater than that at the present said unit time, and so that the amounts of material supplied by the first and the second material supplying means are selectively controlled;

wherein pulverizing efficiency of each of said first and said second mills is optimized continuously, and disturbances to the mills of the kind which equally affect production efficiencies of the mills are without influence on the changing of the setting values by the second and the third control means.

4,691,870

ELECTRIC FOOD PROCESSOR

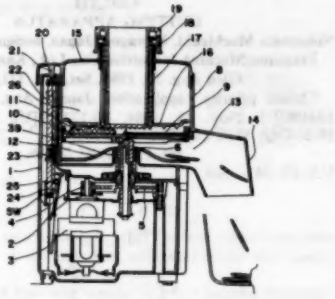
Masao Fukunaga, Yokaichi, and Hiroshi Nonoguchi, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed Oct. 3, 1985, Ser. No. 783,919

Claims priority, application Japan, Oct. 9, 1984, 59-212029; Oct. 9, 1984, 59-212025

Int. Cl.[4] B02C *18/12*

U.S. Cl. 241—36 9 Claims



1. An electric food processor for processing food, said processor comprising:

a main body having an electric motor therein;

a generally cylindrical retaining container detachably mountable on said main body for containing the food processed by the food processor when mounted on said main body, said generally cylindrical retaining container having an upper open end through which the food to be processed is placed therein, and an engagement means at said upper open end;

a rotatable S-shaped cutter for cutting food within said retaining container, said S-shaped cutter operatively connectable to said motor to be rotated thereby within said retaining container when said retaining container is mounted on said main body;

a discharge container detachably mountable on said main body so as to be exchangeable with said cylindrical retaining container, said discharge container having a discharge passage extending therethrough through which food processed within said discharge container is discharged outside of said discharge container, and said discharge container having an upper open end through which food to be processed is placed therein;

a rotatable disc-shaped rotary base having a cutting blade thereon for cutting food within said discharge container, said rotary base operatively connectable to said motor so as to be exchangeable with said S-shaped cutter and so as to be rotated by said motor within said discharge container when said discharge container is mounted on said main body;

a rotary disc operatively connectable to said motor to be rotated thereby when said discharge container is mounted on said main body, said rotary disc being disposed below said rotary base and adjacent said discharge path for discharging the food therethrough that is cut by said cutting blade of said rotary base; and

a removable container lid for covering either of said upper open ends of said retaining container and said discharge container when either of said containers is mounted on said main body, said container lid having a shaft portion slidably mounted thereto and a pressing plate fixed to and extending around one end of said shaft portion, said shaft portion and said pressing plate slidable within said discharge container when said container lid covers said discharge container for pressing food therewithin toward

said rotary base when said discharge container is mounted on said main body and said rotary base is operatively connected to said motor, and said pressing plate and said shaft portion engaging said engagement portion at said upper end of said retaining container when said container lid covers said retaining container such that said pressing plate and said shaft portion are prevented from sliding toward said S-shaped cutter when said retaining container is mounted on said main body and said S-shaped cutter is operatively connected to said motor.

4,691,871

CUTTING APPARATUS

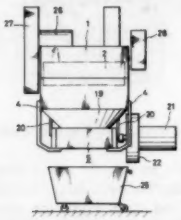
Nobumasa Mochizuki, Kawagoe, Japan, assignor to Mochizuki Precision Machine Industries Co., Ltd., Kawagoe, Japan

Filed Aug. 30, 1985, Ser. No. 771,130

Claims priority, application Japan, Aug. 31, 1984, 59-133480[U]; Nov. 15, 1984, 59-173551[U]; Dec. 15, 1984, 59-264762; Mar. 28, 1985, 60-45284[U]

Int. Cl.[4] B02C *18/16*

U.S. Cl. 241—166 **6 Claims**



1. A cutting apparatus, comprising:

a conveyor having a takeout end;

a pair of upper side plates disposed immediately below said takeout end; first and second cutter shafts disposed substantially in parallel to each other with a prescribed spacing, and interposed between said pair of upper side plates;

a pair of lower side plates, each having first semi-circular bearing notches bored therein, each of said pair of upper side plates having second semi-circular bearing notches bored therein and having detachably connected thereto respective ones of said lower side plates such that said first semi-circular bearing notches, in cooperation with said second semi-circular bearing notches, form circular openings admitting said first and second cutter shafts;

a motor attached to said first cutter shaft for rotating said first cutter shaft;

means for rotating said second cutter shaft in a direction opposed to the direction in which said first cutter shaft is rotated;

a plurality of first substantially disklike cutters fitted around said first cutter shaft;

a plurality of first substantially disklike spacers fitted around said first cutter shaft; said first cutters and said first spacers fitted around said first cutter shaft being alternately arranged and brought into intimate contact with each other in the axial direction of said first cutter shaft;

a plurality of second substantially disklike cutters fitted around said second cutter shaft; and

a plurality of second substantially disklike spacers fitted around said second cutter shaft, said second cutters and said second spacers fitted around said second cutter shaft being alternately arranged and brought into intimate contact with each other in the axial direction of said second cutter shaft, each of said first cutters and each of said second spacers being closely opposed to each other and each of said second cutters and each of said first spacers being closely opposed to each other so as to hold said first and second cutters in mesh with each other.

4,691,872

TOROIDAL WINDING APPARATUS

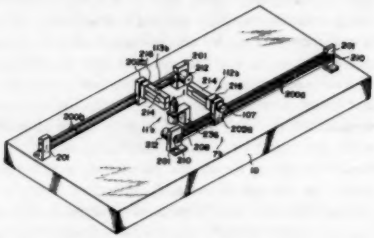
Masahiro Ishida; Shunichi Kato, and Noboru Takasu, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 633,888, Jul. 24, 1984, Pat. No. 4,568,032. This application Dec. 5, 1985, Ser. No. 805,208

Claims priority, application Japan, Jul. 26, 1983, 58-135176; Aug. 23, 1983, 58-152436; Sep. 17, 1983, 58-170598; Oct. 19, 1983, 58-194032; Oct. 25, 1983, 58-199484; Oct. 31, 1983, 58-203836; May 8, 1984, 59-91224; May 8, 1984, 59-91225; May 8, 1984, 59-91226

Int. Cl.[4] H01F *41/08*

U.S. Cl. 242—4 R **23 Claims**



1. A winding apparatus for winding a wire through a through hole of an object on which the wire is to be wound, comprising:

first rotating means for rotating the object about an axis perpendicular to an axis of the through hole of the object between a first position and a second position 180° separated therefrom;

first and second wire feeding means, on opposite sides of the object, for clamping a leading end of the wire and feeding the wire in a direction through the through hole from one end thereof;

first and second moving means for independently moving the first and second wire feeding means, respectively 180° between a front position adjacent to the object and a rear position separated from the object;

second and third rotating means for independently rotating the first and second wire feeding means, respectively 180? about axes perpendicular to the direction of said feeding; and

control means for causing the first moving means to move the first feeding means to the front position thereof so as to clamp the leading end of the wire passing through the through hole,

causing the first moving means to move the first wire feeding means to the rear position thereof so as to suspend the wire between the object and the first wire feeding means, and causing the first rotating means to pivot the object form the first position to the second position so as to wind the wire around the object,

causing the second rotating means to rotate the first wire feeding means by 180° to face the leading end of the wire to the object and causing the first moving means to move the first wire feeding means to the front position thereof,

causing the second moving means to move the second wire feeding means to the front position thereof, thereafter driving the first wire feeding means to feed the wire from the first wire feeding means through the through hole of the object, and causing the second wire feeding means to clamp the leading end of the wire fed from the first wire feeding means,

causing the second moving means to move the second wire feeding means to the rear position thereof to suspend the wire, causing the first rotating means to pivot the object to the first position so as to wind the wire around the object,

causing the third rotating means to rotate the second wire feeding means by 180° to face the leading end of the wire to the object, and causing the second moving means to move the second wire feeding means to the front position thereof,

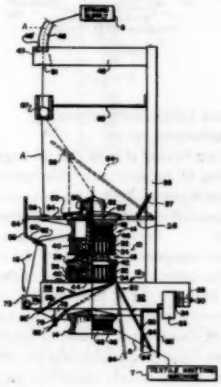
causing the second wire feeding means to feed the wire through the through hole, and thereafter continuously repeating the above sequential steps.

4,691,873

STRAND STORING AND DELIVERING DEVICE

Alan Gutschmit, P.O. Box 708, Troy, N.C. 27371

Filed Jun. 6, 1986, Ser. No. 872,210
Int. Cl.⁴ B65H *51/20*
U.S. Cl. 242—47.01 **23 Claims**



1. A device for transiently storing and delivering a traveling strand to a textile machine or the like, comprising strand storage means having rotatable first and second circumferential portions about and from each of which said strand may be wound and unwound, means for rotatably driving said first and second circumferential portions synchronously, means for guiding said strand to travel in sequence a plurality of windings about said first circumferential portion and a plurality of windings about said second circumferential portion, first stop motion means for monitoring said strand intermediate said first and second circumferential portions for detecting breakages in said strand, whereby said first stop motion means is isolated from tension variations in said strand upstream of said first circumferential portion to detect only actual breakages of said strand, and second stop motion means for monitoring said strand upstream of said first circumferential portion for detecting tension increases in said strand in excess of a predetermined amount without detecting breakages in said strand and other tension decreases in said strand, thereby to prevent at least some breakages in said strand.

4,691,874

METHOD AND APPARATUS FOR WINDING WIRE ROD

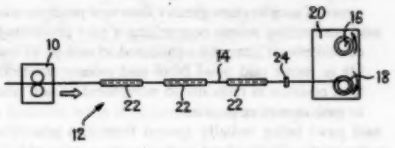
Hiroo Inamori, Nagoya; Sigeyuki Nasuda, Chita; Yoshio Morimoto, Aichi, and Takayuki Haruna, Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 769,694, Aug. 27, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,328
Int. Cl.⁴ B65H *54/00, 54/80*
U.S. Cl. 242—80 **3 Claims**

1. A method of winding wire rods into coils, said method comprising the steps of:

(a) feeding a plurality of wire rods in succession from a rolling mill along a single linear wire path;

(b) providing a first wire winder and a second wire winder in mutually spaced apart relation and mounted on a carriage which is movable to and fro on a linear carriage path that intersects and is perpendicular to said single linear wire path, said first and second wire winders each being rotatable about a vertical axis, said first wire winder having a first side that faces said second wire winder and a second side that is remote from said second wire winder and said second wire winder having a first side that faces said first wire winder and a second side that is remote from said first wire winder;



(c) positioning said carriage so that the first side of said first wire winder is in alignment with said single wire path; then

(d) rotating said first wire winder in a first angular direction so as to wind a first wire rod into a first coil; then

(e) positioning said carriage so that the first side of said second wire winder is in alignment with said single wire path; and then

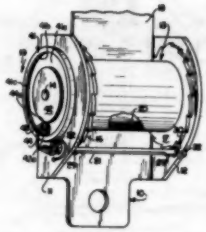
(f) rotating said second wire winder in a second angular direction, opposite from said first angular direction, so as to wind a second wire rod into a second coil.

4,691,875

PLANETARY INERTIAL SEAT BELT RETRACTOR

Wallace C. Higbee, Romeo, Mich., assignor to TRW Automotive Products Inc., Lyndhurst, Ohio

Filed Nov. 13, 1985, Ser. No. 797,593
Int. Cl.⁴ B60R *22/38;* **B65H** *75/38*
U.S. Cl. 242—107.4 B **12 Claims**



1. A seat belt retractor comprising:

a seat belt reel rotatable about an axis in belt retraction and belt withdrawal directions;

a locking pawl movable between a lock position preventing rotation of said reel in said belt withdrawal direction and a release position allowing rotation of said reel in said belt withdrawal direction;

a planetary gear system including a sun gear, a planet gear, and a ring gear, said planet gear meshing with said sun gear and ring gear;

one of said sun and ring gears being connected to rotate about its axis as a function of the rotation of said reel and the other of said sun and ring gears being journaled for free rotation about its axis;

connecting means between said planet gear and pawl for

moving said pawl to said lock position in response to bodily movement of said planet gear to an operative position and for moving said pawl to said release position in response to bodily movement of said planet gear to a non-operative position; and

spring means for biasing said pawl toward said release position;

said planet gear and said other of said sun and ring gears having a predetermined inertia such that said planet gear remains in said non-operative position when said reel rotates in said belt withdrawal direction at a rate of acceleration less than a predetermined rate and moves to said operative position and causes said pawl to lock said reel when said reel rotates in said belt withdrawal direction at a rate of acceleration greater than said predetermined rate;

said connecting means comprising a part projecting axially of said planet gear and connected to said pawl and operable to move said pawl from said release position to said lock position in response to movement of said planet gear to said operative position;

said pawl being radially spaced from the axis of said reel beyond said ring gear; and

said part being a shaped wire extending from said planet gear to said pawl.

4,691,876

BRAKE AND RELEASE APPARATUS FOR A ROTARY NOZZLE BODY

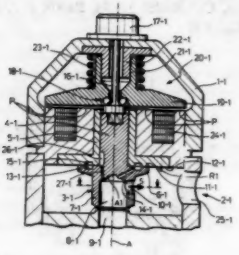
Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 4, 1986, Ser. No. 870,501

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519892

Int. Cl.[4] F42B *15/033*

U.S. Cl. 244—3.22 **15 Claims**



1. Brake and release apparatus for a rotary nozzle body having a rotary shaft disposed in a missile casing and which for guiding the missile delivers a gas thrust jet substantially perpendicular to the direction of the axis of rotation, wherein for adjusting the thrust jet direction, friction coupling means is provided comprising first and second friction surface means, said first and second friction surface means being brought into and out of engagement with one another by setting means, the first friction surface means being disposed on the rotary nozzle body and the second friction surface means being disposed on the missile, wherein when said setting means is not actuated, the first friction surface means is held in frictional engagement against the second friction surface means by a tensioning force, said setting means acting on a rotary shaft of the rotary nozzle body through a thrust/pivot bearing means and providing an actuating force directed counter to the tensioning force.

4,691,877

COMPOUND HELICOPTER AND POWERPLANT THEREFOR

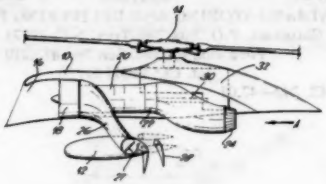
Ralph M. Denning, Bristol, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 555,090, Nov. 25, 1983, abandoned. This application Nov. 14, 1986, Ser. No. 930,990

Claims priority, application United Kingdom, Dec. 1, 1982, 8234318

Int. Cl.[4] B64C *27/22*

U.S. Cl. 244—6 **11 Claims**



1. A compound helicopter comprising:

at least one helicopter rotor:

at least one wing having at least one lift augmentation device for producing lift in addition to that normally produced by the wings in forward flight;

at least one gas turbine powerplant having:

a core engine;

a low pressure compressor driven by the core engine, and

a power turbine driven by the exhaust of the core engine and connected to drive the at least one helicopter rotor;

ducting to convey at least part of the air compressed by the low pressure compressor to said at least one wing; and

a variable area final propulsion nozzle downstream of the power turbine, said nozzle receiving the exhaust from the power turbine and being operable to vary the power absorbed by the power turbine.

4,691,878

TILT-ROTOR WING FOLD MECHANISM AND METHOD

John C. Vaughan, Rockville, Md., and Russel G. Perkins, Jr., Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1985, Ser. No. 795,303

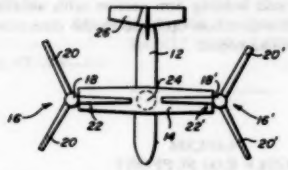
Int. Cl.[4] B64C *27/28, 3/56*

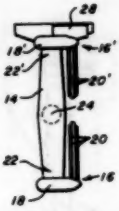
U.S. Cl. 244—7 R **16 Claims**

8. A method for folding the wing of a tilt-rotor-aircraft, said aircraft including a fuselage, a single segment tilt-rotor wing having a tilting rotor-prop assembly on each wing tip and engine cross-shafting therebetween, a tail empennage having a foldable control surface, a rotatable load bearing member disposed between the wing and the fuselage, and at least one lockable load bearing pin joint radially disposed concentric to the rotatable load bearing member, said method comprising the steps of:

folding the rotors of each tilt-rotor-prop assembly inboard;

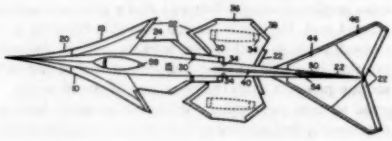
unlocking each load bearing pin joint;
rotating the single segment tilt-rotor wing relative to the





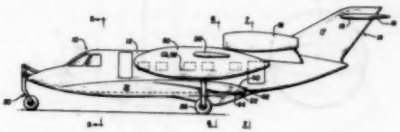
fuselage on the rotatable load bearing member to a configuration substantially parallel to said fuselage; and
locking each load bearing pin joint.

4,691,879
JET AIRPLANE
Vibert F. Greene, 19400 Sorenson Ave., Cupertino, Calif. 95014
Filed Jun. 16, 1986, Ser. No. 875,024
Int. Cl.[4] B64C *39/08*
U.S. Cl. 244—45 R **13 Claims**



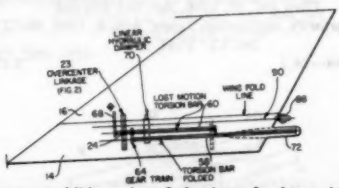
1. A high performance jet airplane comprising:
a fuselage having a delta nose wing and nose strake;
a winglet on the fuselage rearwardly of the nose wing;
a midspan wing coupled with the fuselage rearwardly of the winglet, each of said nose wing, said winglet and said midspan wing having flap means thereon near the rear marginal edge thereof;
a pair of high performance jet engines on each side, respectively, of the fuselage, one of the engines of each side being forwardly of the other engine of the corresponding side;
an upper body stabilizer on the fuselage rearwardly of the midspan wing;
a vertical tail on the fuselage rearwardly of the upper body stabilizer, the vertical tail having flap means at the rear marginal edge thereof;
a V-tail delta wing having two adjustable wing sections and a flap at the rear marginal edge of each adjustable section, respectively; and
an air flow regulator for directing and controlling the flow field of the air along the underside of the delta nose wing and nose strake, said airplane having an aft center of gravity to provide the pilot full control, the airplane being highly maneuverable at high accelerations and at large angles of attack.

4,691,880
TORSION SPRING POWERED MISSILE WING DEPLOYMENT SYSTEM
Arthur M. Frank, Plainview, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Nov. 14, 1985, Ser. No. 798,207
Int. Cl.[4] B64C *3/38, 3/56*
U.S. Cl. 244—49 **3 Claims**



1. A foldable wing deployment system comprising:
a fixed wing section;
a foldable wing section hinged to the fixed wing section;
an overcenter linkage connecting the fixed and foldable wing sections for securely deploying the foldable wing section to a coextensive position with the fixed wing section;
a first torsion bar having a first end connected to a first gear;
a hollowed cylindrical torsion member mounted over the torsion bar, a first end of the member being fixed and a second end being connected to a corresponding second end of the torsion bar;
a second torsion bar located in parallel proximity to the cylindrical torsion member and connected to the overcenter linkage; and
a second gear mounted on the second torsion bar and contacting the first gear for exerting supplementary bias on the overcenter linkage during initial operation thereof for ensuring a substantially linear actuating drive on the linkage, necessary for smooth and reliable wing deployment.

4,691,881
HIGH PERFORMANCE AMPHIBIOUS AIRPLANE
G. Leonard Gioia, 255 Fortenberry Rd., A, Merritt Island, Fla. 32952
Filed Oct. 8, 1985, Ser. No. 785,470
Int. Cl.[4] B64C *35/00, 35/02*
U.S. Cl. 244—106 **14 Claims**



1. In an amphibious aircraft, having a fuselage with a water-contacting hull, wings, tail assembly, and at least one engine, the improvement wherein said fuselage hull includes sponsons integral therewith extending outwardly on either side of the fuselage, wherein the underside of the combination fuselage and sponsons includes a substantially constant cross section inverted channel, the fuselage further including twin keels extending fore to aft on the underside of said hull, the inner surfaces of said twin keels being substantially extensions of the walls of said channel, and further wherein the top to bottom thickness of the aft portion of said sponsons diminishes continuously without any hydrodynamic step toward the aft end thereof so as to terminate in a sharp trailing edge and the hull portion between said sponsons blends smoothly with said tail assembly of the aft end, without a hydrodynamic step.

4,691,882

CO-OPERATIVE SATELLITES

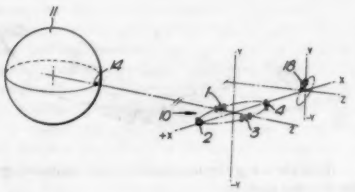
Ronald W. Young, Stevenage, England, assignor to British Aerospace PLC, London, England

Continuation of Ser. No. 570,281, Jan. 12, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 843,846

Claims priority, application United Kingdom, Jan. 12, 1983, 8300747

Int. Cl.[4] B64G 1/10

U.S. Cl. 244—158 R 2 Claims



1. Satellite apparatus in orbit including a plurality of co-operative satellites which orbit as a generally geostationary cluster of co-operative satellites in which inter-satellite communication is to be maintained substantially constantly, and an inter-satellite communication satellite arranged to effect such constant communication, each satellite of the cluster being oriented so that a given region is always earth directed and being placed in its own orbit such that the satellites of the cluster follow each other around a path centered substantially at a given longitude with reference to an earth fixed frame, each satellite of the cluster having its own receptor means directed at all times toward the inter-satellite communication satellite, the inter-satellite communication satellite being placed in an orbit so selected that it follows a path centered substantially at a further longitude spaced from said given longitude to maintain approximate station with the cluster but positioned remotely therefrom whereby the receptor of each satellite of the cluster is directed toward the inter-satellite communication satellite at all times without the receptor rotating through more than one half of one revolution with reference to its satellite.

4,691,883

DEVICE FOR HOLDING ROD-LIKE OBJECTS

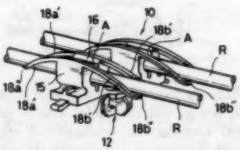
Kazumasa Kurihara, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jul. 28, 1986, Ser. No. 890,868

Claims priority, application Japan, Aug. 8, 1985, 60-122447

Int. Cl.[4] F16L 3/10

U.S. Cl. 248—74.2 3 Claims



1. A device for retaining and guiding a rod-like object comprising: a base portion; a lock portion projecting from one side of said base portion; a holding arm section projecting from an opposite side of said base portion and having a receiving recess for receiving a rod-like object therein inserted in a direction substantially perpendicular to the lengthwise direction of said rod-like object and for retaining said rod-like object sufficiently loosely to permit longitudinal motion; and a damper having canter levered arms laterally extending from a free end of said holding arm section in the direction of the longitudinal axis of said rod-like object and having an engagement portion provided at the free end thereof for engaging with the rod-like object received in said holding arm section with an elastic restoring force in the direction opposite to the direction of insertion of said rod-like object.

4,691,884

GOLF BAG SUPPORT

A. Philip Parduhn, 14501 Wilson Rd., Edmond, Okla. 73034

Filed Dec. 2, 1985, Ser. No. 803,484

Int. Cl.[4] A63B 55/04; A45F 3/44

U.S. Cl. 248—96 2 Claims

1. Apparatus for supporting a golf bag on the ground, comprising:

a tubular housing having a first end and an open second end, the housing having at least one open-ended, unobstructed longitudinal slot formed therein communicating with said second end;

a ground-engaging element, comprising:

a spike section having a first end and a ground-engaging second end, the spike section movable between a retracted position within the housing and an extended position in which at least the second end of the spike section projects from the open end of the housing;

a pedal section, positioned outside the housing, having a depressable first surface and an opposed second surface; and

a ground-engagable wing section means interengaging the spike section and the second surface of the pedal section, the wing section means extending through the slot in the housing when the spike section is in a retracted position; said wing section means being positioned to be pushed into the ground when the pedal section is fully depressed;

biasing means, disposed intermediate the first end of the housing and the first end of the spike section, for biasing the spike section toward a normally retracted position within the housing said biasing means comprising:

a coiled expansion spring positioned within the housing, the spring having a first end anchored at the housing, and a second end;

connecting means for interengaging the second end of the spring and the ground-engaging element; and

stop means for preventing depression of the pedal section beyond the second end of the housing; said stop means comprising;

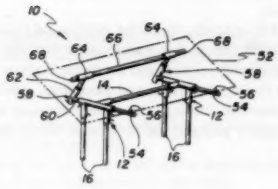
a cross member anchored to the housing and positioned to obstructively engage the connecting means when the pedal section is depressed to a position adjacent the second end of the housing;

attachment means for operatively securing the housing to a gold bag to be supported.

4,691,885
DISPLAY STAND

George F. Lawrance, 2004 Suttle Ct., Rio Rancho, N. Mex. 87124

Filed May 5, 1986, Ser. No. 859,393
Int. Cl.[4] A47B 47/02
U.S. Cl. 248—165 9 Claims



1. A support structure for a display stand, comprising:

a pair of oppositely facing primary coupling units, each of said coupling units including a base tube having an open forward end and an open rearward end, the base tube further having attached thereto near the opposite forward and rearward ends at least a pair of spaced lateral tubes which extend parallel to one another perpendicularly away from said base tube, a central tube attached to and extending from said base tube between said pair of lateral tubes, said central tube extending perpendicular to both said base tube and said lateral tubes, and means for clamping fittings, plugs or the like inserted into any open end of said tubes to retain those fittings, plugs or the like therein, said clamping means including means for adjustably engaging the fittings, plugs or the like inserted into any open end of said tubes, to press the inserted fittings, plugs or the like against an inner surface of said tubes and frictionally hold the inserted fittings, plugs or the like between said inner surface and said engaging means;

a center support bar extending between said coupling units, said center support bar being dimensioned so that its ends can be received within, respectively, said central tube of said coupling units;

at least four display stand legs, each of said legs being dimensioned so that one end thereof can be received within, respectively, said lateral tubes of said coupling units, said oppositely facing primary coupling units being positioned with respect to each other to align all of said legs in a parallel manner downwardly for contact with the ground;

a pair of retainer fittings positioned within and extending from the respective forward ends of said base tubes;

a corresponding pair of riser coupling units positioned within and extending from the respective rearward open ends of said base tubes;

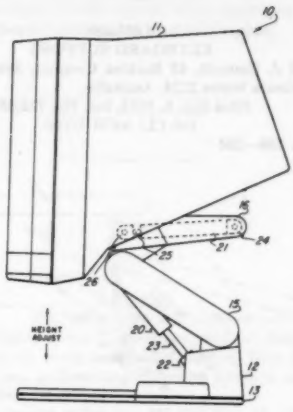
a pair of T-coupling units positioned within and extending generally upwardly from respective ones of said riser coupling units, each of said T-coupling units having an upper tube positioned substantially parallel to said center support bar; and

an upper support bar extending between said upper tubes substantially parallel to said center support bar, said upper support bar being dimensioned so that its ends can be received within, respectively, said upper tubes.

4,691,886
ADJUSTABLE DISPLAY STAND

Robert W. Wendling; John W. Kurtz, and Juan M. Perez, all of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 18, 1985, Ser. No. 724,742
Int. Cl.[4] F16M 11/12
U.S. Cl. 248—183 9 Claims



1. A tilt adjustable display stand comprising:

(a) base means;

(b) display means;

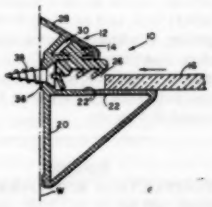
(c) linkage means, connecting the base means to the display means, the linkage means including a tilt housing connected to support the display means and a support housing to which the tilt housing is pivotally attached; and

(d) a tilt gas spring, connected to the tilt housing at one end and to the support housing at the other end, positioned to counterbalance the weight of the display means to enable low force tilting of the display means.

4,691,887
SHELF ANCHOR

Walter L. Bessinger, Grand Haven, Mich., assignor to Knape & Vogt Manufacturing Co., Grand Rapids, Mich.

Filed Aug. 11, 1986, Ser. No. 895,297
Int. Cl.[4] A47B 96/06
U.S. Cl. 248—250 10 Claims



1. A cantilever shelf support for a shelf having a rear portion and a rear edge, comprising:

a bracket having a laterally oriented throat to receive the rear portion of a shelf;

said throat having a lower support platform forming a bottom, an upper overhang forming a top, and an inner end;

a resilient insert in said throat;

said insert having depending finger means extending downwardly toward said platform and being resiliently flexible inwardly of said throat for engagement thereof, and inward flexure thereof, by an inserted rear portion of a shelf;

said insert having depending compression pad means in said throat for supporting abutment with the inserted shelf; and

said insert having a resilient apron depending in front of said throat inner end for protective abutment with the rear edge of the shelf.

4,691,888

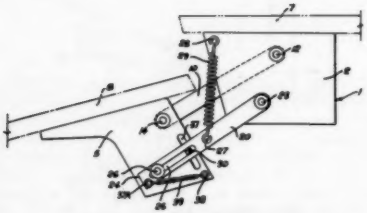
KEYBOARD SUPPORT

Michael J. Cotterill, 43 Rocklea Crescent, Sylvania Heights, New South Wales 2224, Australia

Filed Sep. 9, 1985, Ser. No. 773,552

Int. Cl.[4] A47B *57/06*

U.S. Cl. 248—284 **11 Claims**



1. Keyboard support apparatus comprising keyboard support means, a mounting bracket adapted in use to mount the apparatus to a stationary support, and a linkage system connecting the keyboard support means and the mounting bracket, said linkage system including first means permitting adjustment of the altitude of the keyboard support means relating to the stationary support and including second means permitting adjustment of tilt of the keyboard support means about a horizontal axis, the adjustment of said first means being independent of the adjusted tilt of said keyboard support means and the adjustment of said second means being independent of the adjusted altitude of said keyboard support means, and single control means connected to said linkage system for enabling or disabling both said adjustment of altitude and said adjustment of tilt, said keyboard support means including a keyboard support bracket connected to a first member for pivotal motion about a first axis, the first member being pivotally connected to the mounting bracket for swing motion about a second axis parallel to the first; a second member parallel to the first member and connected to the mounting bracket for pivotal motion about a third axis parallel to and spaced from the second axis, the second member being connected to the keyboard support bracket for pivotal motion about a fourth axis parallel to the first, said members with said brackets forming a four bar linkage and comprising said linkage system and said single control means including clamping means for locking the four bar linkage against movement, the keyboard support bracket being pivotally connected to the first member by slidably cooperating pin means and slot means.

4,691,889

JOINT CONSTRUCTION AND OVERHEAD HANGER

Peter S. Richards, 100 Mt. Si Pl., NW., Issaquah, Wash. 98027

Continuation-in-part of Ser. No. 811,939, Dec. 20, 1985. This application Jul. 18, 1986, Ser. No. 887,749

Int. Cl.[4] F16B *7/10*

U.S. Cl. 248—343 **20 Claims**

16. A mounting structure for a suspended object, comprising:

a support leg member having a lower end socket defined by a cylindrical sidewall having an inner surface;

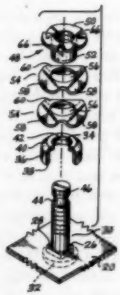
a frame member including a connector assembly, said connector assembly comprising

a threaded rod projecting from said second member and having a base and a free end;

a cam member at the base of the rod having a base end and an opposite end, said cam member being smaller in diameter than the inside diameter of said socket, said cam member including a camming portion at its opposite end;

at least one locking disk having a center opening through which the threaded rod extends, and a plurality of wings spaced around the disk and bent to extend towards the cam portion of the cam member, said locking disk having a plan form sized to allow the locking disk to slip fit into said socket;

a nut threaded onto the threaded portion of the rod axially outwardly of the locking disk, said nut having a thin washer-like head portion and a tubular body portion connected to the head portion and extending axially towards the cam member through the center opening in the locking disk, and a plurality of peripheral barbs with pointed



ends, wherein said peripheral barbs are struck out barbs at the periphery of the head of the nut, said nut having a plan form dimension which in the region of the pointed ends of the barbs is larger than the inner diameter of the socket; and

wherein the first and second members are connected together by firstly a movement of the connector assembly on the second member into the tubular socket of the first member, such first movement causing a force fit of the pointed ends of the barb into the socket, attended by such pointed ends penetrating into and gripping the inner surface of the socket and holding the nut against rotation, and secondly by a tightening rotation of the second member relative to the first member, wherein the points of the barbs connect the nut to the first member during such rotation while allowing relative axial travel of the nut on the threaded rod towards the cam member, such axial travel causing the cam portion of the cam member to push the wings of the locking disk outwardly, so as to press the edges of the wings into tight penetrating engagement with the inner surface of the socket.

4,691,890

RECLINER

Myong-ja Han, 170-47, Kaebong-Dong, Kuro-Ku, Seoul, Rep. of Korea

PCT No. PCT/KR85/00008, § 371 Date Jan. 24, 1986, § 102(e) Date Jan. 24, 1986, PCT Pub. No. WO85/05542, PCT Pub. Date Dec. 19, 1985

PCT Filed Apr. 16, 1985, Ser. No. 827,304

Claims priority, application Rep. of Korea, May 26, 1984, 84-4902

Int. Cl.[4] F16M *11/00*

U.S. Cl. 248—412 **6 Claims**

1. A locking device for adjusting an angle of height of two parts of a seat comprising:

a housing having a rear end and a forward end, said housing being fixed at first part of said seat;

a rod placed within said housing with a rear end thereof slidably extending from said rear end of said housing, said rear end being fixed at second part of said seat;

a push rod slidably inserted within said rod;

a first spring urging said rod forwardly;

a spring cylinder provided within said forward end of said housing;

a cylindrical collet fixed at the forward end of said rod, said collet having an elasticity to be compressed inwardly and being provided with a cleaved portion and engagement portion at the forward end periphery thereof for engaging said spring cylinder;

a cone fixed at the forward end of said push rod and movable within said collet;

a second spring placed in a space between said push rod and collet biasing said cone, and;

a drive means fixed on said second part of said seat for driving said push rod longitudinally of said housing;

whereby when said cone engages with said collet by the action of said second spring, said forward end periphery of said collet abuts with said cylinder thereby locking said rod and said housing together and, when said cone disengages from said collet, said collet is released from said spring cylinder by its own resilient force thereby releasing said rod from said housing.

4,691,891

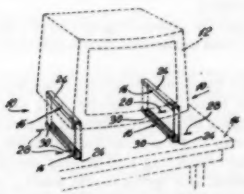
DEVICE FOR PREVENTING UNAUTHORIZED REMOVAL OF PORTABLE OBJECTS

Robert Dionne, 32 Place Gabriel, Candiac, Quebec, Canada J5R 3Y1

Filed Sep. 25, 1985, Ser. No. 780,096

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—551 **10 Claims**



1. An anti-theft device in combination with a portable object retained by said device against removal from a support, said device being interposed between said object and support and comprising a pair of members each formed with an attachment base having an adhesive securing surface facing one direction and with at least one connecting arm prohecting from said base in an opposite direction, said members interconnecting said object and said support through said connecting arms with one member having its attachment base adhesively secured to said object and the other member having its attachment base adhesively secured to said support, said connecting arms extending in side-by-side relationship, and tamper-proof fastening means coupling together said connection arms to thereby securely connect said object to said support while supporting said object in spaced-apart relationship from said support.

4,691,892

SIGN AND SIGN STAND

Ronald E. Grewe; David U. Hillstrom, both of Novi, Mich.; James R. Seely, Avon, and Cecil Ursprung, West Hartford, both of Conn., assignors to Marketing Displays, Inc., Farmington Hills,, Mich.

Continuation-in-part of Ser. No. 442,418, Nov. 17, 1982, Pat. No. 4,548,379, and Ser. No. 751,561, Jul. 3, 1985, Pat. No. 4,593,879, which is a division of Ser. No. 442,418, Nov. 17, 1982, and Ser. No. 719,623, Apr. 2, 1985, Pat. No. 4,569,499, which is a division of Ser. No. 442,378, Nov. 17, 1982, abandoned. This application Oct. 21, 1985, Ser. No. 789,659

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—624 **72 Claims**

1. A sign and sign stand assembly comprising: a base for supporting said assembly, a generally longitudinally-extending stand member, connecting means for connecting said stand member to said base, a sign-supporting member, attaching means for attaching said sign-supporting member to said stand member, resilient biasing means for normally biasing said stand member into a generally upright position, said resilient biasing means being resiliently yieldable to allow said stand member to deflect in a generally downward direction in response to first predetermined forces exerted on said assembly, a substantial portion of said sign-supporting member being free of said stand member and substantially unsupported thereby in order to allow said sign and at least said substantially unsupported portion of said sign-supporting member to pivotally swing relative to the axis of said stand member in response to second predetermined forces exerted on said assembly in a direction generally transverse to said first predetermined forces.

4,691,893

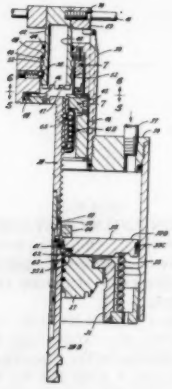
FAIL SAFE GATE VALVES AND ACTUATORS THEREFOR

Neil H. Akkerman, and Gonzalo Vazquez, both of Houston, Tex., assignors to AVA International Corporation, Houston, Tex.

Continuation of Ser. No. 884,869, Jul. 10, 1986, abandoned, which is a continuation of Ser. No. 689,969, Jan. 9, 1985, abandoned, which is a continuation of Ser. No. 342,585, Jan. 25, 1982, abandoned. This application Jan. 28, 1987, Ser. No. 9,655

Int. Cl.[4] F16K *31/14, 31/60*

U.S. Cl. 251—14 **80 Claims**



1. A fail safe valve, comprising

a body having a flowway therethrough and a closure member movable therein between positions opening and closing the flowway, an actuator having a stem including one portion connected to the closure member and mounted for reciprocation in opposite directions to move the closure member between said positions, piston means responsive to the supply of a control fluid thereto for urging the one stem portion in one direction in order to move the closure member to one position and maintain it in that position as long as the control fluid is maintained at a predetermined pressure level, means for yieldably urging the one stem portion in the other direction in order to move the closure member to its other position in the event the control fluid is not so maintained, operating means mounted on the actuator and manipulatable from the exterior thereof for moving another portion of the stem in the one direction to move the closure member to its one position, and means automatically responsive to the failure of a predetermined environmental temperature condition for rendering said operating means inoperative to move said other portion of the stem in said one direction upon reestablishment of said control fluid to said piston means at said predetermined pressure level.

4,691,894

VALVE

Jousi K. Pyötsiä, Helsinki, and Esko T. Yli-Koski, Kerava, both of Finland, assignors to Neles OY, Helsinki, Finland

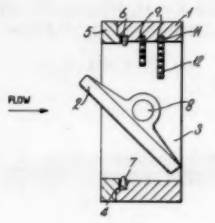
Filed Dec. 23, 1985, Ser. No. 812,324

Claims priority, application Finland, Jan. 9, 1985, 850106

Int. Cl.[4] F16K *47/08*

U.S. Cl. 251—127 **12 Claims**

1. A valve comprising a body provided with a flow passage and a closing member movably mounted in said passage to be pivotable about pivot means between a first position wherein said member blocks flow through said passage and a second position wherein flow through said passage is permitted, sealing means for cooperating with said member when in said first position to seal said passage, said pivot means being disposed in said passage to thereby divide the flow passage between first and second segments, said closing member having a section which is disposed relative to said pivot means so as to pivot in



a generally upstream direction when said closing member moves from said first toward said second position, said passage having a portion downstream of said section of said closing member and at least one attenuation member mounted in said downstream portion of said passage and out of flow impeding relation with the remainder of said flow passage.

4,691,895

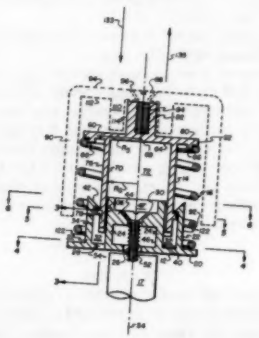
FAUCET HANDLE ARRANGEMENT

Jeffrey L. Garff, 2586 W. 4700 South, #212, Salt Lake City, Utah 84118

Filed Jul. 18, 1986, Ser. No. 886,735

Int. Cl.[4] F16K *35/02*

U.S. Cl. 251—292 **10 Claims**



10. A handle arrangement for a water faucet having a control valve which incorporates a spindle rotatably mounted to open said valve by rotation in a first direction and to close said valve by rotation in a second opposite direction, said handle arrangement comprising;

a connection means for connecting said handle arrangement to said spindle, said connection means defining a retention member;

driving means for mechanically cooperating with said connection means to turn said spindle, said driving means including grasping means for receiving and retaining said retention member to form a mechanical union;

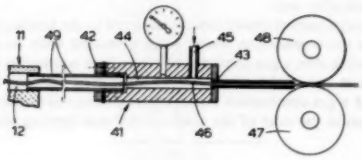
spring means interconnecting said driving means with said connection means, said spring means biasing said driving means away from said connection means;

wherein said mechanical union of said retention member and said grasping means resists forces directed thereagainst in all but one direction and exerts a force against said drive means directed opposite that of said spring means.

4,691,896
OPTICAL FIBRE TRANSMISSION LINE

Michael H. Reeve, and Stephen A. Cassidy, both of Ipswich, England, assignors to British Telecommunications, Great Britain

Continuation of Ser. No. 551,640, Nov. 8, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 848,950
Claims priority, application United Kingdom, Nov. 8, 1982, 8231840; Apr. 8, 1983, 8309671
Int. Cl.[4] B66F 3/24
U.S. Cl. 254—134.4 37 Claims



1. A method of advancing a lightweight and flexible optical fibre member along a previously installed tubular pathway in situ, said tubular pathway extending between two points, said method comprising:

(a) inserting the free end of a lightweight and flexible optical fibre member into the previously installed pathway by applying to said fibre member a force in the direction of insertion;

(b) inserting a gaseous medium into the pathway with a flow velocity much higher than the desired rate of advance of said fibre member through said pathway; and

(c) propelling the free end and following portions of a fibre member along the pathway continuance of said insertion force in cooperation with fluid drag of said gaseous medium passed throughout the length of the pathway in the desired direction of advance such that the pulling force on the optical fibre is distributed throughout the length of said fibre then present in the pathway enabling the fibre member and its advancing free end to be advanced past bends which may be present in the pathway without an unacceptable pulling force being concentrated on any portion of the fibre, said gaseous medium having substantially higher velocity than said fibre member throughout the length of the pathway.

33. Apparatus for installing a lightweight flexible optical fibre member into and along a length of previously installed tubular pathway between first and second ends of the pathway, said apparatus comprising:

first means for flowing a gaseous medium within said pathway toward said second end at a flow velocity substantially higher than the desired fibre member advancement rate;

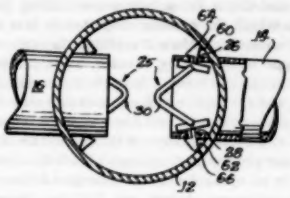
second means for inserting and advancing a free end of said fibre member into said flowing gaseous medium by applying to said fibre member an insertion force directed towards said second end; and

said first and second means cooperating to propel said fibre member through said tubular pathway by producing viscous drag forces distributed along the advancing length of the fibre member then disposed within the pathway while the fibre member advances at a velocity substantially less than the gaseous flow velocity until said free end of the fibre member reaches said second end of the pathway.

4,691,897
RAIL LOCK DEVICE FOR TUBULAR FENCE

Donald R. Frush, Warsaw, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Mar. 18, 1986, Ser. No. 840,891
Int. Cl.[4] E04H 17/14
U.S. Cl. 256—65 14 Claims



14. A releasable rail locking device for a tubular fence comprising:

a generally V-shaped flexible bow-like portion elastically deformable over a predetermined range of angles;

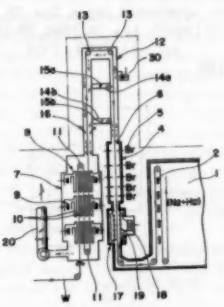
said bow-like portion terminating in respective oppositely oriented outwardly extending gripping portions each for releasably grippingly engaging a wall internally and externally thereof of a tubular fence rail member about aligned diametrically opposed through apertures therein;

said gripping portions and said bow-like portion being sized to extend the gripping portions into engagement with said through apertures in said tubular fence rail wall while maintaining said bow-like portion in a partially compressed condition and with said gripping portions configured to encourage a toggle-like action of said device between a first position wherein said bow-like portion is directed into said rail member and a second position wherein said bow-like portion is directed out of said rail member.

4,691,898
CONTINUOUS ANNEALING FURNACE FOR METALLIC STRIP

Masayuki Imose, Kawanishi, Japan, assignor to Chugai Ro Co., Ltd., Osaka, Japan

Filed Dec. 10, 1985, Ser. No. 807,228
Claims priority, application Japan, Dec. 28, 1984, 59-278457
Int. Cl.[4] C21D 9/56
U.S. Cl. 266—89 3 Claims



1. A continuous annealing furnace for annealing a metallic strip travelling therethrough, said furnace comprising:

a vertical direct firing type non-oxidizing furnace in which exhaust gases are generated as the metallic strip travels therethrough in a downward vertical direction;

a radiation type preheating zone upstream from said direct firing type non-oxidizing furnace relative to the direction of travel of the metallic strip through said direct firing type non-oxidizing furnace, the exhaust gases generated in said direct firing type non-oxidizing furnace passing back through said radiation type preheating zone,

said radiation type preheating zone having a first vertical portion connected at one end thereof to and above one end of said direct firing type non-oxidizing furnace and through which the metallic strip travels in a downward vertical direction before travelling through said direct firing type non-oxidizing furnace, an upper portion extending at one end thereof from the other end of said first portion and through which the metallic strip travels before travelling through said first portion, a second vertical portion connected at one end thereof to the other end of said upper portion and through which the metallic strip travels in an upward vertical direction before travelling through said upper portion, and direction changing roller means in said upper portion and over which the metallic strip is guided in said upper portion for changing the direction of travel of the metallic strip from the upward vertical direction in which the metallic strip travels through said second vertical portion to the downward vertical direction in which the metallic strip travels through said first vertical portion;

a vertical forced convection type preheating zone connected at one end thereof to the other end of said second vertical portion below said second vertical portion and juxtaposed with said direct firing type non-oxidizing furnace and through which the metallic strip travels in an upward vertical direction before travelling through said second portion; and

at least one gas bypass duct open to and connected between said first portion and said second portion of said radiation type preheating zone below said upper portion thereof for causing a portion of the exhaust gases passing back through said radiation preheating zone to pass therethrough and bypass said upper portion and said direction changing roller means therein, said at least on gas bypass duct having an adjustable damper therein for selecting the amount of exhaust gases that are caused to pass therethrough.

4,691,899

APPARATUS FOR REACTOR IRON MAKING

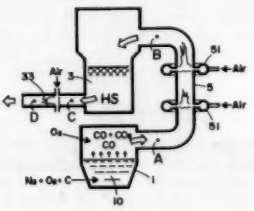
Kiyohide Hayashi; Saburo Sugiura, both of Aichi, and Noboru Demukai, Gifu, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Filed Jun. 24, 1985, Ser. No. 748,280

Claims priority, application Japan, Jun. 29, 1984, 59-134479; Jun. 29, 1984, 59-134659; Jun. 29, 1984, 59-134660

Int. Cl.[4] F27D *17/00*

U.S. Cl. 266—140 **5 Claims**



1. An apparatus for reactor iron making comprising:

a furnance body provided with tuyeres for blowing into the furnace body carbonaceous powder and oxygen, a waste gas outlet attached thereto, and a cover positioned over the furnace body, the cover is opened when the furnace body is charged with material to be melted;

a heating shaft above the furnace body and cover, the heating shaft provided with a combustion gas inlet in its upper portion, and a combustion gas outlet in its lower portion to which an air duct is connected so that combustion gas flows into the heating shaft from the upper inlet, and leaves the heating shaft from the lower outlet, and into which heating shaft a raw material is intermittently charged, heated by the heat of combustion gas flowing through the heating shaft, while being held in the shaft, and transferred to the above-mentioned furnace body;

a raw material bucket positioned over the heating shaft which periodically supplies raw materials to the above-mentioned heating shaft, the furnace body, the heating shaft, and the raw material bucket being arranged nearly vertically; and

a gas combustion tower closely adjacent to the heating shaft, the gas combustion tower being provided with air-introducing slits, a gas combustion tower inlet connected to the waste gas outlet of the above-mentioned furnace body, and a gas combustion tower outlet connected to the combustion gas inlet of the above-mentioned heating shaft.

4,691,900

METAL MELTING FURNACE

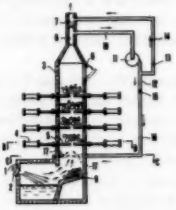
Isamu Maeda, Kanagawa, Japan, assignor to Kankyo Souken Consultant, Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1986, Ser. No. 896,764

Claims priority, application Japan, Aug. 23, 1985, 60-185300

Int. Cl.[4] C22B *1/00*

U.S. Cl. 266—156 **3 Claims**



1. A metal melting furnace equipped with a preheating tower having a plurality of fork-shaped shelfplates extending into the inside thereof, comprising:

a gas mixing chamber provided in the lower end portion of the tower, communicating with the upper portion of the melting furnace,

a duct for circulating combustion exhaust gas from the top portion of the tower into the gas mixing chamber,

a damper arranged in the duct for controlling the amount of the combustion exhaust gas circulated into the gas mixing chamber, and

a plurality of nozzles connected to the duct and opening into the gas mixing chamber.

4,691,901

GAS RINSING STOPPER PREVENTING MIXING OF AIR WITH RINSING GAS

Gerd-Erich Dobner, Neukirchen-Vluyn, Fed. Rep. of Germany, assignor to Didier-Werke Ag, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,627

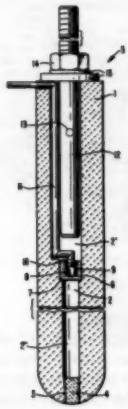
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545763

Int. Cl.[4] B22D *41/10, 11/10*

U.S. Cl. 266—236 **9 Claims**

1. in a gas rinsing stopper for use with a vessel containing

molten metal, said stopper including a stopper member having therethrough an axial gas passage, a mounting fixture extending into a first end of said gas passage, a gas feed opening at a second end of said gas passage, and a gas supply line extending into said gas passage for supplying rinsing gas thereto and thereby for discharging said rinsing gas through said gas feed opening, the improvement comprising means for preventing said supplying of said rinsing gas to said gas passage from creating a reduced pressure at said first end of said gas passage



and causing atmospheric air to be drawn inwardly through said first end of said gas passage and mixing with said rinsing gas within said gas passage, said preventing means comprising:

a seal member positioned within said gas passage and forming a gas tight seal separating said gas passage into a first section including said mounting fixture and a second section leading to said gas feed opening; and

said gas supply line opening into said second section of said gas passage, whereby said rinsing gas is isolated from said first section of said gas passage.

4,691,902

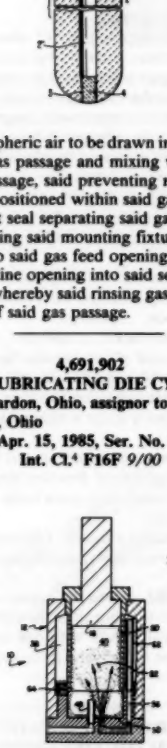
SELF-LUBRICATING DIE CYLINDER

Paul M. Kadis, Chardon, Ohio, assignor to Teledyne Industries, Inc., Brecksville, Ohio

Filed Apr. 15, 1985, Ser. No. 723,036

Int. Cl.[4] F16F 9/00

U.S. Cl. 267—119 **11 Claims**



8. A cushion for use in a press, said cushion assembly comprising a piston, a cylinder at least partially enclosing said piston, said piston and cylinder cooperating to at least partially define a variable volume working chamber which expands during operation of the press from a closed condition to an open condition and contracts during operation of the press from the open condition to the closed condition, said cylinder having a cylindrical inner side surface disposed in engagement with said piston and a cylindrical outer side surface which is coaxial with said inner side surface and said piston, a housing connected with and circumscribing said cylinder, said housing having a cylindrical inner side surface disposed in a coaxial relationship with and spaced from the cylindrical outer side surface of said cylinder, said inner side surface of said housing and said outer side surface of said cylinder cooperating to at least partially define an annular reservoir chamber which is coaxial with said cylinder, circumscribes said cylinder, and is coextensive with said cylinder for at least a major portion of the length of said cylinder, a standpipe disposed in said annular reservoir chamber and having a longitudinal axis which is parallel to the central axis of said cylinder and disposed on a radius of the cylindrical inner side surface of said housing at a location between the outer side surface of said cylinder and the inner side surface of said housing, and passage means for conducting a flow of lubricating liquid along a flow path from said standpipe to said working chamber during expansion of said working chamber and for conducting a flow of lubricating liquid from said working chamber back along the same flow path toward said reservoir chamber during contraction of said working chamber.

4,691,903

HOLDER FOR SMALL PARTS

Leopold A. Castille, Rte. 7, Box 17 E15, Opelousas, La. 70570

Filed Apr. 11, 1986, Ser. No. 850,705

Int. Cl.[4] B25B 1/00

U.S. Cl. 269—6 **7 Claims**

1. An adjustable small parts holder which comprises:

(a) a cylindrical body having an externally threaded upper portion traversed at equidistant intervals around the perimeter of its uppermost portion by a plurality of radially aligned vertical slots and having an axially aligned hollow channel extending throughout its entire length, at least a portion of said channel being internally threaded;

(b) a plurality of jaws individually disposed in and extending upwardly and outwardly from said slots and pivotally attached therein to said body at the lower portions of the respective jaws, said jaws (i) being bowed outwardly along their lengths and having convex outer surfaces, (ii) having inwardly projecting upper end portions convergeable toward a common center external to and axially aligned with the body, and (iii) having their respective centers of gravity external to the locus of their respective pivotal attachments to the body;

(c) an internally threaded collar threadably secured to the external threaded upper portion of the body and (i) adapted upon rotation in one direction to engage an outwardly bowed convex outer surface portion of each of the jaws and to cause the upper end portions thereof to converge toward said common center, and (ii) adapted upon rotation in the other direction to allow the jaws to pivot away from each other by the force of gravity;

(d) linear supporting means coaxially disposed within and extending throughout the entire length of said hollow

channel, the lower portion of the supporting means extending below the body and the uppermost portion of the supporting means extending above the uppermost portion of the body and being adapted to be moved upwardly into close proximity with said common center and alternatively to be moved downwardly away from said common center, at least a portion of the supporting means being externally threaded so as to threadably secure the supporting means to the internally threaded channel of the body; and

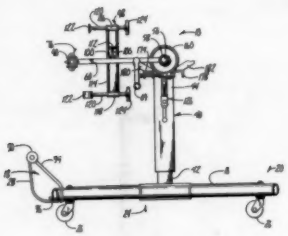
(e) an adjusting screw knob disposed on the lower portion of the supporting means below the body and (i) adapted upon rotation in one direction to move the uppermost portion of the supporting means into close proximity with said common center, and (ii) adapted upon rotation in the other direction to move the uppermost portion of the supporting means downwardly away from said common center.

4,691,904

AUTOMATIC OR STANDARD TRANSMISSION HANDLING DEVICE

Max D. Armstrong, Des Moines, Iowa, assignor to Robert J. Williams, Des Moines, Iowa, a part interest

Filed Aug. 8, 1985, Ser. No. 763,670
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—17 **16 Claims**



1. An equipment handling device, comprising:

a frame having forward and rearward ends and opposite sides;

column means extending upwardly from said frame and having a first end fixed to said frame and a spaced apart second end;

a horizontally disposed elongated shaft mounted on said second end of said column means;

arm means having a first end mounted on said shaft and a spaced apart second end;

support means on said arm means for holding said equipment remote from said first end of said arm means;

said arm means being pivotable about a horizontal axis defined by the longitudinal axis of said shaft whereby said equipment is selectively positionable along an arc centered on said horizontal axis for work thereon;

said arm means including a pair of spaced apart arm members each being mounted on said shaft for rotation therewith;

said arm members each including first support means for securely engaging a first portion of said equipment and supporting said equipment in said fixed position;

second support means mounted on said arm means for engaging a second portion of said equipment to hold said equipment in said fixed position; and

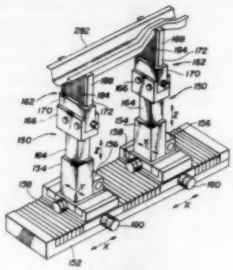
said second support means including a crossbar extending between said arm members and having at least one head member thereon for engaging said equipment.

4,691,905

MACHINE FOR HOLDING WORKPIECE

Kinichi Tamura, Tokyo; Susumu Kawada, Kamakura; Yoshitada Sekine, Tokyo; Kazuyoshi Abe, Tokyo; Ryosuke Ishikawa, Tokyo, and Fumiki Yokota, Yamato, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 18, 1985, Ser. No. 724,577
Int. Cl.[4] B25B *27/14*
U.S. Cl. 269—45 **8 Claims**



1. A holding unit comprising:

a laminated body having a number of substantially identical shaped elongate plates, each having one end and an opposite end, said elongate plates being abuttingly engaged one after another with the one ends thereof cooperating one after another to form a workpiece supporting surface;

means for moving said elongate plates in a longitudinal direction thereof so as to vary the shape of said workpiece supporting surface to create a new one;

means for biasing said laminated body so that said elongate plates are firmly engaged one after another so as to keep the newly created shape of said workpiece supporting surface; and

a housing mounted to said guiding and positioning means, said housing having mounted thereto means for carrying said laminated body;

wherein said carrying means comprises:

a pair of parallel guide plates having therebetween a first spacer and a second spacer, said pair of parallel guide plates, and said first and second spacers cooperating with each other to define a space within which said laminated body is disposed;

each of said elongate plates being formed with a guide hole running in the longitudinal direction thereof;

a beam extending through said guide holes between said first and second spacers;

a pair of sliders slidably mounted relative to said first and second spacers, respectively, and connected to said beam, respectively; and

extendable-contractible means for urging said first and second sliders to slide to bring all of the ends of said elongate plates to substantially flush with one after another, thus breaking the shape of the workpiece supporting surface.

4,691,906

APPARATUS FOR SUPPORTING THE WALLS OF APPLIANCES AND THE LIKE DURING FOAMING

Thomas S. Zastrow, St. Paul, Minn., assignor to Remmele Engineering, Inc., St. Paul, Minn.

Filed Apr. 19, 1985, Ser. No. 725,319
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—48.1 **29 Claims**

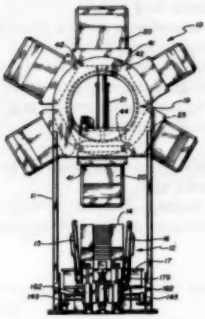
1. An apparatus for supporting the walls of an appliance or the like during foaming comprising:

an apparatus frame;

a support bed connected with said apparatus frame for supporting said appliance during foaming;

a pair of exterior side support panels connected to a portion of said apparatus frame and movable relative to said support bed between a retracted position and a foaming position in which said exterior side support panels are in supporting engagement with the exterior surface of a corresponding pair of appliance walls;

a plurality of plugs each having at least a pair of interior support surfaces for supporting engagement with the interior surface of a corresponding pair of appliance walls;



plug carrier means connected with said apparatus frame for moving a selected one of said plurality of plugs between a first position in which said plug is fully inserted within the interior of the appliance and a second position in which said plug is fully withdrawn from the appliance;

plug storage means connected with said apparatus frame for storing those plugs other than said selected one; and

plug transfer and connection means for selectively transferring and connecting said selected plug either from said plug storage means to said plug carrier means or from said plug carrier means to said plug storage means.

4,691,907

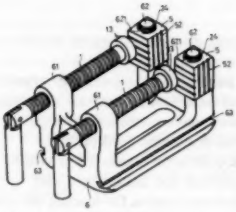
C-CLAMP STRUCTURE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Mar. 6, 1985, Ser. No. 708,883

Int. Cl.[4] B25B *1/00*

U.S. Cl. 269—152 **1 Claim**



1. A unitary integrally casted dual C-clamp structure, comprising, in combination, a common base having forward and rearward ends, said base having a slot formed therein, facilitating mounting the base on a support, a first pair of substantially-parallel supports formed integrally with the forward end of the base transversely thereof, each of the supports being non-movable relative to one another and having a threaded hole formed therein along an axis substantially transverse thereto, a threaded rod in each hole, the rods having respective longitudinal axes and extending substantially parallel to each other and to the slot of the base, the rods having respective forward and rearward end portions, the forward end portion of each rod extending forwardly beyond the respective upstanding support, a crank handle pivotably carried by the extending forward end portion of each rod, said handle being pivotable a full 180 degrees, a clamping element carried by the rearward end of each rod, a second pair of substantially-parallel spaced-apart upwardly extending supports formed integrally with the rearward end of the base transversely thereof, each of said supports terminating below the longitudinal axes of the threaded rods, each second support having a respective end portion defining a respective shoulder thereon, each respective end portion provided with a shaft thereon, each of the shafts having a respective longitudinal axis extending substantially parallel to the other respective longitudinal axis and perpendicular to the longitudinal axes of the threaded rods, a freely rotatable prismatically-shaped clamping block carried on each respective shaft end abutting and being supported by the shoulder of each respective second support, each clamping block being substantially uniformly polygonal in cross-section and having a plurality of faces, and each of the faces of the clamping blocks being provided with grooves formed thereon, the grooves of each face being substantially parallel to one another and further being substantially perpendicular to the grooves of the faces immediately adjacent thereto, each clamping block being spaced from the other and each being freely rotatable on its respective second support independently of one another and may be automatically angularly adjusted by a workpiece being clamped relative to its respective second support about an axis substantially perpendicular to the longitudinal axis of its respective threaded rod, thereby facilitating the clamping of an irregularly-shaped workpiece in the C-clamp structure, wherein each clamping block is rotatably retained on one of said shafts by a retaining means which permits free rotation of the clamp block by the workpiece.

4,691,908

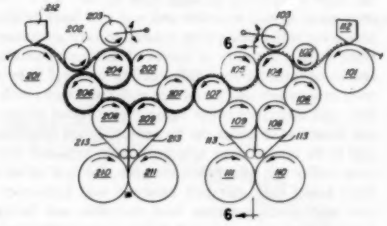
APPARATUS FOR INTERFOLDING

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jan. 6, 1986, Ser. No. 816,441

Int. Cl.[4] B41F *13/56*

U.S. Cl. 270—21.1 **10 Claims**



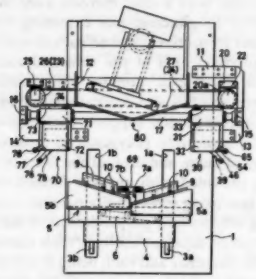
1. Apparatus for interfolding webs comprising two pluralities of vacuum rolls, web cutoff means operably associated with each of said roll pluralities, means for feeding a web to each of said cutoff means, an interfolding means operably associated with each of said roll pluralities and spaced from its associated web cutoff means, said vacuum rolls being arranged to develop four equal length single web paths between said cutoff means and said interfolding means, and switching means operably associated with said vacuum rolls for altering the vacuum applied to certain of said rolls to direct web segments to either of said interfolding means.

4,691,909

DEVICE FOR TURNING OVER BOOK LEAVES

Toshiro Owada; Kenichi Kosugi, both of Atsugi, and Yasuo Nagase, Machida, all of Japan, assignors to Ministry of International Trade & Industry and Agency of Industrial Science & Technology, both of Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,443
Claims priority, application Japan, Apr. 18, 1985, 60-81226
Int. Cl.[4] B65H *39/02;* **G09F** *11/00*
U.S. Cl. 270—58 **4 Claims**



1. A device for turning over book leaves comprising:
a book holder having means for supporting a book in an open state;
a moveable unit disposed above said book holder and mounted on means for moving said movable unit substantially vertically with respect thereto and also in direction substantially perpendicular to a seam of the book supported on said book holder;
a turn-over roller rotatably mounted on said movable unit such that said turn-over roller may be brought into forced contact from above with the surface of the book on said book holder, then rotated in this contacting state to turn up towards the book seam several leaves of the book and then rotated in an opposite direction to release the turned-up leaves other than the leaf to be turned over; and
a pinch member rotatably mounted on said movable unit at a position for clamping the remaining turned-up leaf being turned over in co-operation with an upper portion of said turn-over roller;
wherein said turn-over roller is brought into contact with the book supported on said book holder with a relative movement of said movable unit and said book holder, said turn-over roller being then rotated to turn up towards the book seam a plurality of leaves of the book including the leaf to be turned over while holding said leaf to be turned over in between said turn-over roller and said pinch member, said turn-over roller being then rotated in the opposite direction to cause the turned-up leaves other than the leaf to be turned over to escape from between side turn-over roller and said pinch member, the leaf to be turned over being then clamped between said turn-over roller and said pinch member, said movable unit being then moved relative to said book holder toward the book seam.

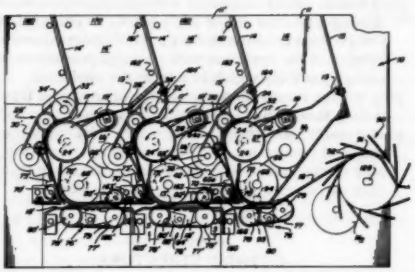
4,691,910

DOCUMENT DISPENSER

N. Allen Cargill, Warminster, and Michail Malashkin, Chalfont, both of Pa., assignors to Technitrol, Inc., Philadelphia, Pa.

Filed Aug. 13, 1986, Ser. No. 896,071
Int. Cl.[4] B65H *5/06, 3/44*
U.S. Cl. 271—3 **22 Claims**

1. A document dispenser for dispensing documents from a plurality of stacks of documents comprising:
a feeder/stacker module including
a frame,
means on said frame defining a bin for holding a first stack of documents,
a stacker means for receiving successively fed documents and stacking them, and
means for feeding documents from said first stack through a first document feed path to said stacker means,
said document feeding means being mounted on said frame and including
document feeding and separating apparatus for feeding documents from the first stack so they move individually in a successive condition through the initial portion of said first document feed path,
document acceleration means for providing a space between the successively fed documents, and
document delivery means for feeding the spaced apart documents through a delivery portion of said first document feed path to said stacker means; and
a feeder module including
a frame,
means on said frame defining a bin for holding a second stack of documents, and
means for feeding documents from said second stack through a second document feed path,

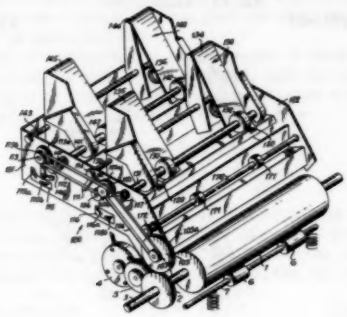


said last-named document feeding means being mounted on said frame and including
documeht feeding and separating apparatus for feeding doucments from said second stack so they move individually in a successive condition through the initial portion of said second document feed path,
document acceleration means for providing a space between the successively fed documents, and
document delivery means for feeding the spaced apart documents through a delivery portion of said second document feed path and into the entrance of said delivery portion of said first document feed path of said feeder/stacker module,
whereby the documents fed through said first document feed path pass from said first stack, are separated, and pass through the document delivery means of said feeder/-stacker module to said stacker means, and
the documents fed through said second document feed path pass from said second stack, are separated, and pass through the document delivery means of said feeder module and then through the document delivery means of said feeder/stacker module to said stacker means.

4,691,911
PAPER FEEDING APPARATUS FOR PRINTERS

Hitoshi Nakagawa, and Kohei Kitahara, both of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,574
Claims priority, application Japan, Jul. 31, 1985, 60-169440
Int. Cl.[4] B65H *3/44*
U.S. Cl. 271—9 24 Claims



1. A paper feeding apparatus for a printer having a paper feed motor, comprising:

at least two mounting means each of which is adapted to contain sheets of paper;

paper feeding means associated with each of the mounting means and contacting the paper in the mounting means for feeding single sheets of paper from the mounting means;

paper feed gear means operatively coupled to each of the paper feeding means for co-rotation therewith;

sun gear means proximate each of the paper feeding gear means, each being rotatable about a center point;

transmission means for transmitting rotational power in first and second directions, said directions being opposite to one another, from the paper feed motor in the printer to each of the sun gear means;

selector means associated with each of the paper feeding means having a planet gear on a first arm and a protrusion on a second arm, the selector means being rotatable about the center point of the corresponding sun gear means, said planet gear engaging with said corresponding sun gear means; and

selective camming means associated with each of the paper feeding means for controlling the rotation of the corresponding selector means by interaction with the protrusion on corresponding selector means to cause the selective engagement of the corresponding planet gear and paper feed means so that rotational power from the paper feed motor is transmitted to the paper feeding means when said paper feed motor rotates in the proper combination of said first and second directions;

whereby a single sheet of paper is fed to the printer from a selected mounting means which is determined by the sequence of rotations of the paper feed motor in the first and second directions.

4,691,912
DEVICE FOR SEPARATING FLAT OBJECTS

Hanno Gillmann, Constance, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

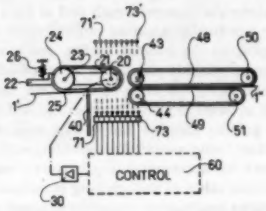
Filed Jul. 2, 1985, Ser. No. 751,608
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424397
Int. Cl.[4] B65H *3/04*
U.S. Cl. 271—10 1 Claim

1. A device for singling and separating flat objects, in particular letters, from a stack of flat objects, comprising:

drawoff means for drawing flat objects one at a time from a stack of flat objects and feeding them onto a feed path in a feed direction;

transport means on said feed path spaced from said drawoff means for receiving flat objects from said drawoff means and feeding them on said feed path, the flat objects being fed in succession on said feed path and having an actual gap therebetween;

a plurality of sensors disposed along said feed path in an area between said drawoff means and said transport means and over at least a portion of said drawoff means for sensing the passage of flat objects and the actual gaps therebetween;



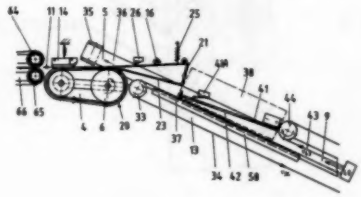
drive means connected to said drawoff means and activatable to start and stop said drawoff means to start and stop feeding of flat objects on said feed path; and

control means connected to said sensors and to said drive means for measuring the actual gap between successive flat objects on said feed path and for comparing the measured actual gap with a predetermined desired gap minus an allowance for acceleration behavior of the flat objects, and for actuating said drive means at a time to change the actual gap to approximately equal the desired gap minus the allowance for acceleration behavior, the change being used by said control means to determine the acceleration behavior for a subsequent flat object on said feed path.

4,691,913
SEPARATING APPARATUS FOR FLAT OBJECTS

Werner Frank, Insel Reichenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Nov. 22, 1985, Ser. No. 801,147
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444335
Int. Cl.[4] B65H *3/04*
U.S. Cl. 271—34 25 Claims



15. Singling apparatus for flat objects which are aligned on one of their edges along a feed direction, comprising guiding means defining a transport path for the objects extending in the feed direction, deflecting means having at least one movable part for moving a belt along a draw-off path in a draw-off direction, a draw-off belt engaged on said deflecting means and movable in said draw-off direction, said belt defining a contact region which is tangential to said transport path, exit means defining an exit gap with said belt on said draw-off path spaced from said contact region, and transport means for feeding

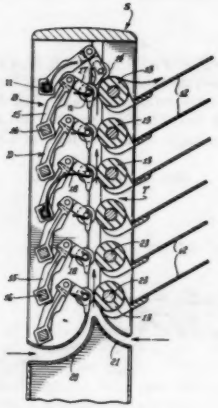
objects along a transport path in the feed direction and into contact with the belt at the contact region, said deflecting means being shaped so that there results a singling of the objects by a substantially tangential admission of the objects onto said draw-off belt, said belt then moving the objects to the exit gap in the draw-off direction, whereby only the objects coming into direct contact with the moving draw-off belt are drawn off by application of the objects against the draw-off belt and by means of friction between the draw-off belt and the objects, in the draw-off direction, said guiding means comprising a pair of guiding members lying on opposite sides of the transport path for guiding objects therebetween, one guiding member on one side of the transport path having a first portion extending along the transport path and at least a point corresponding to a normally occuring object length away from the contact region, to the contact region, and a second portion extending approximately parallel to the draw-off belt from the contact region along the draw-off direction, said first portion extending at an acute angle with respect to said second portion of said one guiding member and at least one of said first and second portions being mounted for pivoting with respect to the transport path for accommodating between said one guiding member and the other of said guiding members flat objects of different widths and biasing means connected to said at least one of said first and second portions of said one guiding member for biasing said at least one of said first and second portions toward the other of said pair of spaced guiding members, said other of said pair of spaced guiding members extending parallel to transport path.

4,691,914

SHEET RECEIVER

Frederick J. Lawrence, Tustin, Calif., assignor to Gradco Systems, Inc., Irvine, Calif.

Filed Jan. 21, 1986, Ser. No. 819,969
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—297 **6 Claims**



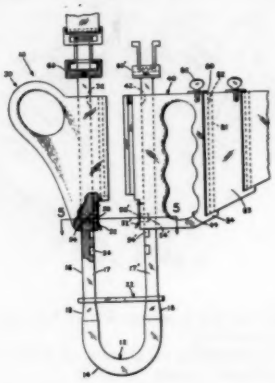
1. Sheet receiver apparatus comprising: a frame structure, a plurality of trays in spaced relation to receive sheets, sheet transport means in said frame structure to carry sheets by a straight path from an inlet past ends of said trays, said transport means including a plurality of driven sheet feed rolls and sheet diverters having nip rolls opposing said feed rolls, said feed rolls and said nip rolls normally being in positions confronting one another on a common plane extending between said feed and nip rolls and defining said straight path, means for actuating said diverters to move between said normal position and a position at which the nip roll is confronting a next adjacent feed roll and is offset from said plane towards a tray, whereby a sheet is diverted from said straight path into a tray.

4,691,915

VERSATILE FITNESS KIT

Bernard Sutton, 128 Lafayette Ave., Brooklyn, N.Y. 11238

Filed Dec. 27, 1985, Ser. No. 814,107
Int. Cl.[4] A63B *11/08*
U.S. Cl. 272—68 **4 Claims**



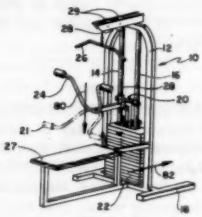
1. A versatile fitness kit including a U-shaped spring resistance device having elongated legs, a weighted thumb gripping means, a weighted finger gripping means, said weighted thumb gripping means including a joining means, said weighted finger gripping means including another joining means, said weighted thumb gripping means detatchably mounted on one of said elongated legs, said weighted finger gripping means detachably mounted on the other of said elongated legs, whereby the fingers of the hand engage the finger gripping means and the thumb engages the thumb gripping means and said hand may be manipulated to squeeze said U-shaped spring resistance device, and said weighted thumb gripping means and said finger gripping means when detached may be interconnected to each other by each said joining means to form a hand weight.

4,691,916

EXERCISE APPARATUS WITH TROLLEY SYSTEM

Harvey C. Voris, Garden Grove, Calif., assignor to Paramount Fitness Corporation, Los Angeles, Calif.

Filed Jan. 9, 1985, Ser. No. 691,033
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **15 Claims**



1. An exercise apparatus, comprising:
a frame support structure;
at least one guide rod secured to the support structure;

a plurality of resistance weights slidably disposed on said at least one guide rod;

a trolley slidably connected by coupling means to the at least one guide rod for upward and downward movement, the coupling means comprising only two sets of rollers which sets are vertically spaced apart and are positioned only on opposite sides of said at least one guide rod;

means for applying force to the trolley positioned on the same side of said at least one guide rod as the uppermost set of said rollers; and

means for connecting the trolley to one or more of the resistance weights and for interacting with the resistance weights to help maintain the alignment of the trolley on said at least one guide rod.

4,691,917

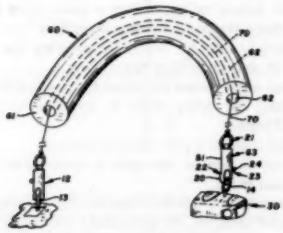
BI-BRACHIAL MOTIVE SUPPLEMENTING DEVICE

Dino Battista, 11900 NE. 16th Ave., N. Miami, Fla. 33161

Continuation-in-part of Ser. No. 666,440, Oct. 30, 1984, abandoned. This application Nov. 19, 1985, Ser. No. 799,554

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—126 **10 Claims**



1. An arm movement enhancing device capable of providing users who cannot otherwise raise their arms to functional positions, the ability to raise either arm by the application of downward force to said device by the opposite arm, wherein said device comprises:

an inelastic member having a length and two ends,

a collar, short enough to allow the hands of the user to come into proximate association with the user's face when worn on the user's neck, which during use is so arranged and disposed to be capable of being comfortably worn by the user at the back of said user's neck said collar comprising;

channel means therethrough with an opening at each end of said channel means wherein a portion of the length of said inelastic member is slidably contained within said channel means and one of said inelastic member ends extends from one of said openings and the other end extends from said other opening, and wherein said openings are positionable such that one opening is on one side of the head of the user and the other is positionable at the other side of the head, and wherein said channel means further comprises a stiffening means for providing a firmness to the shape of said collar and so arranged and disposed with respect to said collar so as to provide for the comfortability to the user and so as to interfere with the slidability of said inelastic means,

cushioning means so arranged and disposed to fit against the neck of the use, being comfortably shaped to be supportable thereon by said channel means and stiffening means,

a right and a left attachment means for attachment of the right and left arms of the user, respectively, connected to that end of said inelastic means which is on the right or left side of the user, respectively.

4,691,918

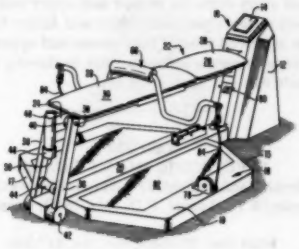
MULTIPLE EXERCISE DEVICE

Gary L. Rockwell, LaGrange, Ga., assignor to Diversified Products Corporation, Opelika, Ala.

Filed Oct. 8, 1985, Ser. No. 785,440

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—134 **16 Claims**



1. A floor-supported multiple exercise device comprising:

a floor-supported base having a platform with front and back ends and a pulley guide extending from said front end to said back end;

a bench assembly attached to said base for supporting a user of the exercise device, and including a bench disposed above said platform;

variable resistance means operatively connected to said base for providing a variable amount of exercising resistance through an extensible and retractable load cable emanating adjacent said front end of said platform;

a traveling pulley assembly connected to said load cable and longitudinally slidable within said pulley guide;

an exercise cable trained around said traveling pulley and extending through said pulley guide toward the back end of said platform;

cable guide means fixed to said floor-supported base for guiding said exercise cable from the back end of said platform upwardly on both sides of said bench, and

at least one user-engageable handle selectively attached to the ends of said exercise cable or to said load cable.

4,691,919

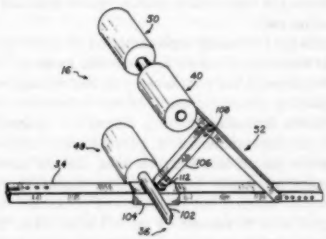
THERAPY TABLE WITH FEET ANCHOR APPARATUS

Jerry L. Roberson, 301 S. Cage, Pharr, Tex. 78577

Continuation-in-part of Ser. No. 869,227, Jun. 2, 1986, abandoned. This application Nov. 13, 1986, Ser. No. 930,644

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—145 **17 Claims**



1. Apparatus for anchoring a person's feet to an object, comprising:

foot engaging means attachable to said object for anchoring the feet of the person, said foot engaging means including lower foot support means for engaging one area of the

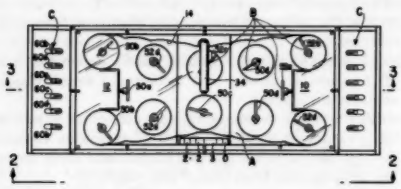
person's feet, said lower foot support means being movable toward and away from the person, and including upper foot support means pivotally fixed to said foot engaging means for swinging into a position proximate another area of the person's feet to thereby anchor the feet to said foot engaging means, and means for linking said lower foot support means to said upper foot support means so that when said lower foot support means is pushed away from the person said upper and lower foot support means open, and when said lower foot support means is moved toward said person said upper and lower foot support means close together to thereby capture the person's feet and anchor the feet.

4,691,920

ELECTRONIC HOCKEY GAME

Dale P. Murphy, 863 Cliffside Dr., Akron, Ohio 44313, and Paul D. Murphy, 6 E. Walnut, P.O. Box 266D, Frankfort, Ohio 44628

Filed Jan. 10, 1986, Ser. No. 817,549
Int. Cl.[4] A63F 7/06
U.S. Cl. 273—85 A **20 Claims**



1. A mechanical action game apparatus comprising:

a generally planar playing surface;

a plurality of playing figures mounted adjacent the playing surface for movement relative thereto, each figure having a figure sensing means for electronically sensing interaction between the figure and a playing piece;

figure control means for controlling movement of the figures relative to the playing surface, whereby the figures are adapted to move the playing piece around the playing surface;

goal means for defining at least one goal area in conjunction with the playing surface;

goal sensing means for sensing passage of the playing piece into the goal area;

path means for selectively defining a plurality of optically visible straight paths, at least some of the paths extending from at least some of the figures to the goal area, each path having at least a more readily visible state and a less visible state; and

means for schematic representation of action replay causing at least one of the paths to assume its more visible state in response to the goal sensing means sensing passage of the playing piece into the goal, the schematic representation means including scoring means for determining which figure last contacted the playing piece before the playing piece passed into the goal area, and for directing the instant schematic representation means to cause a path which extends between the last contacted figure and the goal area to assume its more visible state, the schematic representation means being operatively connected with the figure sensing means, the goal sensing means and the path means, whereby after each goal is scored an instant schematic replay is provided to show which figure scored.

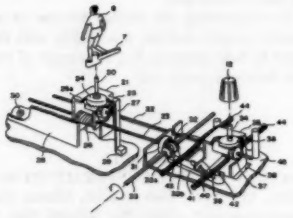
audio response means providing a preselected sequence of audio sounds which vary in composition, intensity and rate, depending upon the type and rate of play action.

4,691,921

AUTOMATED GAME PANEL

Takeo Iseki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,282
Claims priority, application Japan, Nov. 8, 1985, 60-171748[U]
Int. Cl.[4] A63F 7/06
U.S. Cl. 273—85 B **11 Claims**



4. An automated game panel for moving player dolls so as to move an object, comprising:

(a) a casing having an upper portion with a surface having slits formed therein, and a lower portion;

(b) power means for generating a drive force having a forward direction and a reverse direction;

(c) rotating means for manually rotating the player dolls about an axis normal to the surface;

(d) manual input means for receiving a manual input and for providing the drive force in response to the received manual input;

wherein said manual input means includes

(i) a control member movable in response to said received manual input,

(ii) transmission means, operatively connected to said control member, for selectively providing to said drive means one of the forward direction drive force, the reverse direction drive force and no drive force in accordance with the movement of said control member, and

(iii) biasing means for biasing said control member in a neutral position so that said transmission means provides no drive force to said drive means in the absence of said manual input; and

(e) movement means for automatically moving respective ones of the player dolls along corresponding slits in response to the drive force provided by said manual input means;

(f) drive means for receiving the drive force from said manual input means, the drive means including

(i) a shaft,

(ii) a first worm gear mounted on said shaft, and

(iii) a first crown gear mounted on said shaft;

(g) carriage means, operatively connected to receive the drive force from said drive means, for moving respective ones of the player dolls along corresponding slits in response to the received drive force,

wherein the carriage means includes a slidable support member slidably mounted on said shaft and having housed therein said first worm gear; and

(h) a rack mounted on said casing so as to engage said first worm gear.

10. An automated game panel for moving player dolls so as to move an object, comprising:

(a) a casing having an upper portion with a surface having slits formed therein, a lower portion and goal areas;

(b) power means for generating a drive force;

(c) rotating means for manually rotating the player dolls about an axis normal to the surface;

(d) manual input means for receiving a manual input and for

providing the drive force in response to the received manual input;

(e) movement means for automatically moving respective ones of the player dolls along corresponding slits in response to the drive force provided by said manual input means,

wherein said movement means includes-

(i) drive means for receiving the drive force from said manual input means,

(ii) carriage means, operatively connected to receive the drive force from said drive means, for moving respective ones of the player dolls along corresponding slits in response to the received drive force; and

(f) centering means, mounted within said casing, and operatively connected to said power means, for automatically projecting the object towards the goal areas.

4,691,922

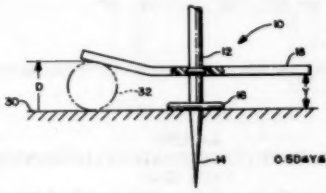
GOLF PRACTICE DEVICE

Robert M. Peel, 2328 Newton St., Akron, Ohio 44305, and John T. Darner, 150 Davenport Ave., Arkon, Ohio 44312

Filed Mar. 10, 1986, Ser. No. 837,794

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—177 B **12 Claims**



1. A golf practice device comprising:

(a) an elongated shaft having one end adapted to be inserted into the ground for supporting said shaft in a substantially upright postion with its other end uppermost; and

(b) a thin, relatively stiff, flexible, bendable, generally planar target having memory, said target being mounted on said shaft near said one end thereof and extending outwardly at a right angle therefrom, the diameter of said target being about equal to the diameter of a golf hole, and means for connecting said target to said shaft so that said target will bend in response to a golf ball rolling thereunder and contacting same when said target is held by said shaft at a predetermined distance above a putting surface.

4,691,923

GOLF GAME APPARATUS

Walter Schwartz, 680 Bardal Bay, Winnipeg, Manitoba, Canada R2G 0J2

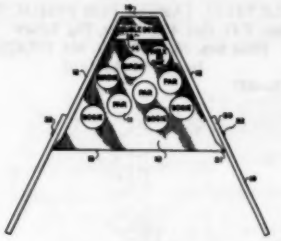
Filed Mar. 21, 1986, Ser. No. 842,229

Claims priority, application Canada, Mar. 29, 1985, 477962

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—180 **2 Claims**

1. A ball receiver for use in playing a game of carpet golf or the like on a substantially planar surface and comprising in combination a multi-apertured ramp board including a front edge, a rear edge and side edges, two front rows of apertures and a plurality of further apertures rearwardly thereof formed through said ramp board, a surrounding frame consisting of a side member along each side edge of the board defining an open front entrance to said board and means at the rear of said side members, spaced from the rear edge of said board, closing off the rear of the receiver, said side members and said means at the rear thereof extending above the plane of the board, and a rear recess at the rear of the board defined by the rear edge thereof, said side members and the means at the rear of the side members, said apertures being positioned so that the front two rows of apertures act as traps to the remaining apertures situated rearwardly of said front two rows thereby reducing the width of the path along which the ball may travel to reach said further apertures, forwardly extending side members each pivoted by one end thereof to adjacent the distal or front end of one of the side members and movable through approximately 180° in an arc in a vertical plane from a stored position



whereby said extension side members lie substantially horizontally alongside the corresponding side member, to a playing position whereby said extending side members lie as forward extensions of said corresponding side members and in longitudinal alignment therewith, with the height of both the side members and the extension side members being substantially similar when in the playing position and the stored position.

4,691,924

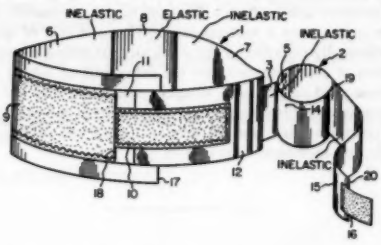
GOLFER'S ARM MOVEMENT CONTROL DEVICE

Michael P. Strong, Miami, Fla., assignor to J. B. Golf Enterprises, Inc., Birmingham, Ala.

Filed May 7, 1986, Ser. No. 861,861

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—189 R **6 Claims**



6. A golf training device having a first band (1) adapted to surround the chest of a golfer and a second inelastic band (2) adapted to surround and restrain the lead arm of a golfer, said first band (1) having a first end (17) with attachment means (9) on the outer surface adjacent said first end (17) and a second end (18) with first attachment means (11) on the inner surface adjacent said second end (18) for attaching said second end (18) of said first band with said attachment means (9) on the outer surface of said first band (1) adjacent said first end (17) of said first band and second attachment means (10) on the outer surface of said first band (1) adjacent said second end (18), a flexible inelastic strap (3) having a first end attached (4) to the outer surface of said first band (1) intermediate said first and second ends (17 & 18) of said first band (1) and a second end attached (5) to said second band (2) intermediate the ends (19 & 20) of said second band (2) and attachment means (16) on one end (20) of said second band (7) for attaching one end (20) of said second band (2) with said second attachment means (10) on the outer surface of said first band (1), whereby said second

band (2) contacts the lead arm of a golfer to restrain the lead arm and control the golfer's swing.

4,691,925

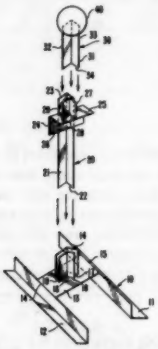
PORTABLE STEEL TARGET FOR PISTOL SHOOTING

Paul Scholem, P.O. Box 418, Grant, Fla. 32949

Filed Sep. 18, 1985, Ser. No. 777,422

Int. Cl.[4] F41J *1/10*

U.S. Cl. 273—407 **11 Claims**



1. A firearms target support structure comprising a base unit having a pair of leg members and a horizontal support plate member affixed to said leg members along spaced apart portions of said plate member, said plate member having a vertically extending engagement section which engages an upright leg member upon which a firearms target is retained, an upright unit having a vertical leg portion one end of which is mechanically engaged by the vertically extending engagement section of said base unit and the other end of which retains thereon said target, and wherein said vertically extending engagement section, said upright leg member and said vertical leg portion of said upright unit are comprised of interfitting angle iron members.

4,691,926

RACKET, ESPECIALLY A TENNIS RACKET, HAVING A GRIP SLEEVE WITH SPRING ELEMENTS

Gunter Adam, Straubing, Fed. Rep. of Germany, assignor to PUMA AG Rudolf Dassler Sport, Herzogenaurach, Fed. Rep. of Germany

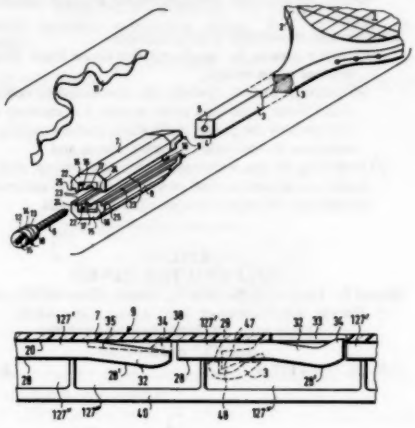
Filed Aug. 24, 1984, Ser. No. 644,016

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332289; Jan. 4, 1984, 3400174

Int. Cl.[4] A63B *49/08*

U.S. Cl. 273—73 J **40 Claims**

28. A racket, especially a tennis racket, with a frame surrounding a ball hitting area, said frame having a shaft onto which a grip sleeve is mounted to form a hand-grip, and an adjustment means for adjusting the length of the racket by changing the position of the hand-grip on the shaft, wherein said grip sleeve is formed of at least two at least similar sleeve parts that are formed of a hard, elastically resilient material and that have projections which extend inwardly toward the shaft and run in a longitudinal direction relative to the shaft, and wherein said projections of the sleeve parts comprise resiliently deflectable means for balancing of tolerances between



the grip sleeve and the shaft by resiliently resting against the shaft.

4,691,927

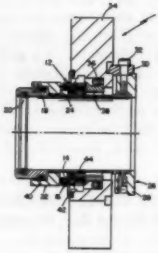
TEMPERATURE-COMPENSATING MECHANICAL FACE SEAL

Walter J. Sudol, Plaistow, N.H., and Michael P. Habich, North Reading, Mass., assignors to A. W. Chesterton Company, Stoneham, Mass.

Filed Dec. 1, 1986, Ser. No. 936,326

Int. Cl.[4] F16J *15/36*

U.S. Cl. 277—26 **11 Claims**



1. In a mechanical face seal of the diaphragm bellows type, comprising:

a face seal ring having a body defining a substantially flat, annular sealing surface, and

a holder adapted to be disposed radially about said face seal ring in interference fit with a loaded surface of said seal ring, said holder defining a shoulder surface for engaging upon a corresponding shoulder surface of said face seal ring, said holder positioning said seal ring for sealing engagement with an opposed sealing surface of a relatively rotating, second seal ring, and said holder defining a loading surface adapted to apply radially inwardly directed contact pressure upon the opposed loaded surface of said face seal ring,

said face seal ring and said holder having different coefficients of thermal expansion,

the improvement wherein

the contact pressure applied by said holder upon said face seal ring is applied to an area of said face seal ring loaded surface, the resultant of said contact pressure being disposed axially between said sealing surface and the centroid of said face seal ring thereby to cause the sealing surface to lie substantially flat at varying temperatures of operation.

4,691,928

ANTI-VIBRATIONAL ELECTRICAL-CONDUCTIVITY-CONFORMED SEAL ARRANGEMENT

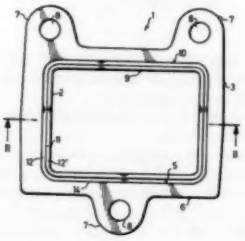
Berthold W. Abele, Walheilm, Fed. Rep. of Germany, assignor to KSA Dichtsysteme GmbH, Vaihingen, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 774,655

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433376

Int. Cl.[4] F16J *15/10*

U.S. Cl. 277—235 B **16 Claims**



1. A seal having an elastomeric sealing part provided with sealing portions, and an associated carrier part, with structural parts which are to be sealed off being adapted to be pressed against surfaces of said carrier part;

the improvement wherein said sealing part has a coaxially extending peripheral surface disposd between said sealing portions, which are provided on opposite sides of said sealing part having two sealing lips provided on opposite sides of said sealing part as well as including two surfaces cutting into each other in a sealing edge and extending from said peripheral surface as well as from inner periphery of said sealing part; wherein said carrier part consists of synthetic material resistant to compression; wherein said surfaces of said carrier part against which said structural parts are to be pressed are in the form of two parallel abutment surfaces of said synthetic material, with a side surface of said synthetic material being disposed transversely between said abutment surfaces, said sealing lips projecting over said abutment surfaces; and wherein said peripheral coaxially extending surface of said sealing part is vulcanized to said side surface of said carrier part, said peripheral coaxially extending surface of said sealing part being axially equal in length to said side surface of said carrier part.

4,691,929

DRILL BIT CHUCK FOR DRILLING AND CUTTING DEVICES

Anton Neumaier, Fürstenfeldbruck; Hans-Jürgen Hoereth, Langenbach, and Gerhard Rumpp, Inning, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Liechtenstein

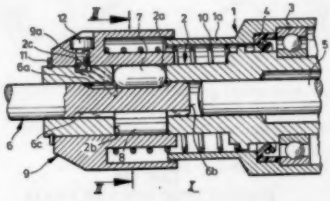
Filed Nov. 12, 1986, Ser. No. 929,919

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1985, 3539912

Int. Cl.[4] B23B *31/10*

U.S. Cl. 279—19.3 **8 Claims**

1. Tool chuck for securing one end of an axially extending tool bit in a device for use in drilling and cutting operations, with the tool bit having at least one axially extending first slot closed at the opposite ends thereof and at least one axially extending second slot with one and thereof being open at the one end of the tool bit, wherein said tool chuck comprises an axially extending guide tube having at least one first aperture extending radially therethrough, and at least one second aperture extending radially therethrough with said first and second apertures being in spaced relation, a locking member positioned within said at least one first aperture, an entrainment strip positioned within said at least one second aperture, an axially extending adjusting sleeve closely encircling said guide



tube, said adjusting sleeve having a first pocket therein arranged to receive said locking member and a second pocket arranged to receive said entrainment strip and said adjusting sleeve being displaceable relative to said guide tube for retaining said locking member and entrainment strip in a radially inner position in engagement with the first and second slots in the tool bit and for receiving said locking member and entrainment strip in a radially outer position in engagement with said first and second pockets out of engagement with the first and second slots in the tool bit so that the tool bit can be removed from said tool chuck.

4,691,930

WHEELED VEHICLE

Michael Samuel, Flat J, Queens Drive, Finsbury Park, London, United Kingdom N42HW

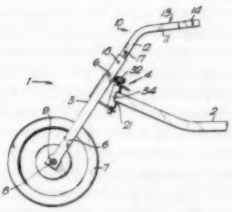
PCT No. PCT/GB85/00396, § 371 Date May 30, 1986, § 102(e) Date May 30, 1986, PCT Pub. No. WO86/01480, PCT Pub. Date Mar. 13, 1986

PCT Filed Sep. 4, 1985, Ser. No. 864,189

Claims priority, application United Kingdom, Sep. 5, 1984, 8422410

Int. Cl.[4] B62K *13/00*

U.S. Cl. 280—7.1 **20 Claims**



1. A convertible wheeled vehicle which is capable of assembly into any one of a plurality of different vehicles, the convertible vehicle comprising:

(a) a front wheel frame assembly;

(b) means for mounting at least one wheel to said front wheel frame assembly;

(c) a chassis assembly;

(d) means for mounting at least one wheel to said chassis assembly; and,

(e) means for pivotally connecting said chassis assembly to

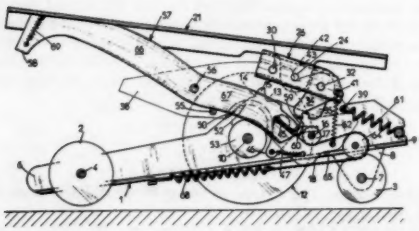
said front wheel frame assembly in a selected one of a plurality of different orientations of said chassis assembly, each orientation of said chassis assembly corresponding to a different vehicle, said connecting means comprising a pair of vertically spaced plates rigidly connected to said front wheel frame assembly, a mounting assembly fixed at one end of said chassis assembly and adapted to be received between said spaced plates, and retaining means for retaining said mounting assembly between said spaced plates in one of at least two selectable orientations relative to said plates.

4,691,931

PROPELLING ROLLER SKATE

Yvon M. Vincent, 1 Avenue des Bosquets, 91800 Brunoy, France

Filed Jul. 23, 1986, Ser. No. 888,335
Claims priority, application France, Aug. 5, 1985, 85 11947
Int. Cl.[4] A63C *17/12*
U.S. Cl. 280—11.115 **8 Claims**



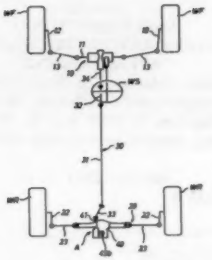
1. A propelling roller skate comprising a roller frame carrying drive wheels; a drive shaft carried by the frame; pedal means for supporting a foot, the pedal means supported above the frame and pivotable relative to the frame about a transverse axis from a standby position to one of a propulsion position and a braking position; propulsion means carried by the frame; braking means carried by the frame; selection means pivotably supported on a pivot carried by the pedal means and having two positions, namely a "propulsion" position for controlling the propulsion means and a "braking position" for controlling the braking means, wherein the selection means includes a selector on which the pedal is articulated and which selector carries positioning studs adapted to cooperate with positioning notches carried on the frame, stop snugs carried by the selector and adapted to cooperate with the braking means when the selector turns about the pivot carried by the pedal means, in order to select the "propulsion" position, a stop finger carried by the selector for defining a propulsion stop and a brake stop; a propulsion lever pivotally carried by the braking means and cooperatively engageable with the propulsion stop; wherein the braking means is articulated on the drive shaft, about which it is adapted to turn in a "braking" selection position in order to act on the driving wheels, and wherein the brake stop cooperates with a catch for locking the selection means in a "propulsion" selection position, and elastic means connected with the selector for returning the selector to a "standby" position between the propulsion position and the braking position when no pressure is applied to the pedal.

4,691,932

FOUR-WHEEL STEERING SYSTEM FOR AUTOMOTIVE VEHICLES

Youichi Hyodo, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 3, 1986, Ser. No. 869,891
Claims priority, application Japan, Jun. 4, 1985, 60-84400[U]
Int. Cl.[4] B62D *3/02*
U.S. Cl. 280—91 **6 Claims**



1. A four-wheel steering system for an automotive vehicle having a pair of dirigible front road wheels and a pair of dirigible rear road wheels, comprising:

a front wheel steering mechanism operable in response to a steering operation to steer the front road wheels;

a rear wheel steering mechanism including an operation rod axially movable in response to operation of said front wheel steering mechanism to steer the rear road wheels;

a linkage arranged in a fore-and-aft direction of the vehicle and having one end drivingly connected to said front wheel, steering mechanism; and

a connecting mechanism assembled in combination with said rear wheel steering mechanism and being drivingly connected to the other end of said linkage for effecting axial movement of the operation rod in response to operation of said front wheel steering mechanism;

wherein said connecting mechanism comprises:

a housing to be mounted on a body structure of the vehicle;

a carrier rotatably mounted within said housing and being arranged to rotate about a first axis perpendicular to the longitudinal axis of said operation rod;

drive means mounted on said housing to effect rotary motion of said carrier about said first axis;

a bell crank rotatably mpunted on said carrier and arranged to rotate about a second axis in parallel with the longitudinal axis of said operation rod when said carrier is retained in a neutral position, said bell crank having a first arm extending therefrom at a predetermined angle to said first axis and a second arm extending therefrom along said first axis;

a first link having one end pivotally connected with the first arm of said bell crank and the other end operatively connected to said linkage to be moved along said first axis in response to operation of said front wheel steering mechanism; and

a second link pivotally connected with the second arm of said bell crank and operatively connected to said operation rod.

4,691,933

WHEELCHAIR PARKING BRAKE

Herbert Strauss, 688 W. Lynwood St., Thousand Oaks, Calif. 91360

Filed Mar. 6, 1984, Ser. No. 586,850
Int. Cl.[4] B60T *1/04*
U.S. Cl. 280—289 WC **6 Claims**

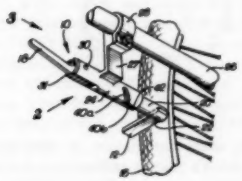
1. A parking brake for a wheelchair, comprising:

a locking bar; and

mechanical means for moving the locking bar between a first angular position in which the locking bar is not intersecting the plane of a wheel of the wheelchair, and a second angular position in which the locking bar intersects the plane of the wheel, and for moving the locking bar in a substantially radial direction with respect to the wheel, between a released position and a locking position, the bar being in locking contact with the wheel when in the second angular position and the locking position, wherein the mechanical means for moving the locking bar includes

a tube rigidly connected to the wheelchair,

a shaft connected to the locking bar and mounted for sliding and rotational movement within the tube,



hand-operated means for applying axial motion to the shaft within the tube, to move it in the radial direction, and

camming means for converting axial movement of the shaft to an angular movement between the first and second angular positions;

wherein the mechanical means functions to apply the brake by moving the locking bar initially to the second angular position and an intermediate radial position, and then to the locking position while maintaining the second angular position.

4,691,934

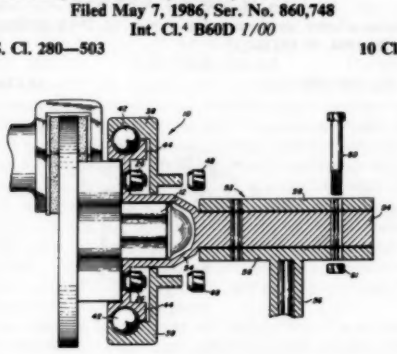
TOWING SYSTEM FOR VEHICLES

Jack Tomse, 119 Third St., LaSalle, Ill. 61301

Filed May 7, 1986, Ser. No. 860,748

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—503 **10 Claims**



1. A steer bar device attachable to a vehicle for towing of said vehicle and for enhancing steering action response in the steering system of said vehicle, comprising:

means for coupling a towing vehicle to said steer bar device; and

frame means for connecting selected wheel hubs of said vehicle to said coupling means, said frame means transmitting steering action from said towing vehicle to said selected wheel hubs and in turn to the steering system of said vehicle.

4,691,935

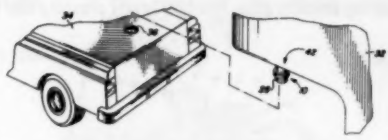
ANTI-THEFT TRAILER ASSEMBLY AND TRAILER HITCH LOCK

Louis Brandt, 44643 Fern Ave., Lancaster, Calif. 93534

Filed Aug. 4, 1986, Ser. No. 892,296

Int. Cl.[4] B60R *25/00*

U.S. Cl. 280—507 **2 Claims**



1. An improved automatically locking trailer lock, said lock comprising, in combination:

(a) a lock body having two halves, including a generally inverted U-shaped upper half having a pair of depending spaced arms releasably disposed against a pair of upstanding arms of a generally U-shaped lower half, said two halves defining therebetween a central opening extending transversely therethrough and dimensioned to receive the generally central annular recessed portion of a trailer hitch post; and

(b) an automatic locking mechanism disposed in said lock body, said mechanism comprising:

i. a pair of posts secured in the arms of said upper half and depending therefrom into openings in the arms of said lower half, the lower portions of said posts bearing facing notches,

ii. a generally transverse locking plate having opposite ends received in said notches to lock said posts and said upper half to said lower half,

iii. a key lock component fixedly secured to said plate and extending to the lower end of said lower half, said key lock component being rotatable with a key to correspondingly rotate said plate to an unlocked position wherein said opposite plate ends are out of said notches, thereby permitting withdrawal of said upper half from said lower half; and

iiii. biasing means biasing said plate into said locked position,

(c) wherein said locking mechanism includes a return spring biasing said plate into said locked position and wherein the bottom ends of said posts are dimensional and tapered to temporarily move said plate ends into the unlocked position against said biasing spring force during insertion of said posts into said openings,

(d) wherein said spring is generally V-shaped, wherein the lower ends of said depending arms have further depending peripheral rims and wherein the upper ends of said upstanding arms have recessed peripheries to receive said peripheral rims, whereby said halves have improved resistance against prying apart.

4,691,936

SKI BINDING, IN PARTICULAR FOR USE IN CROSS-COUNTRY SKIING

Gerhard Nowak, Biedermannsdorf; Alfred Winter; Hans P. Morbitzer, both of Vienna; Klaus Kruschik, Gumpoldskirchen, and Rudolf Theuer, Trumau, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Feb. 12, 1986, Ser. No. 828,953

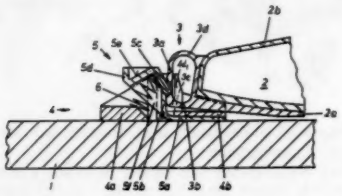
Claims priority, application Austria, Feb. 18, 1985, 474/85

Int. Cl.[4] A63C *9/00*

U.S. Cl. 280—615 **8 Claims**

1. A cross-country skiing assembly, comprising a bearing block secured to a ski, a ski shoe receiving part stationarily fixedly connected to a bearing block, a hook element provided on a toe portion of a ski shoe, a locking element supported on

said bearing block and having at least one locking protuberance thereon said hook element is secured against movement on said receiving, said hook element including a hook bar which extends generally vertically to an upper surface of said ski in front of said toe portion and having means thereon operatively engaged by said locking protuberance, a spring means yieldably urging said locking element into operative locking relation with said hook bar, said receiving part having at least, in a skiing position, guide bars operatively engaging said hook



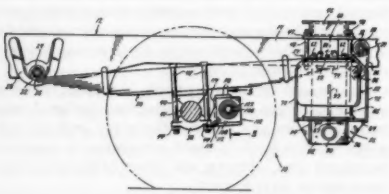
element, said guide bars extending approximately perpendicularly to an upper side of said ski and project inwardly from said receiving part, and a pair of elastic web members, one of said web members being connected to and extending between a top part of said toe portion of said ski shoe and a top part of said hook bar, and the other of said web members being connected to and extending between a bottom part of said toe portion of said ski shoe and a bottom part of said hook bar, said web members both being elastically yieldable in response to a movement of said ski shoe relative to said ski.

4,691,937

VEHICLE SUSPENSION ASSEMBLY

John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Filed May 19, 1986, Ser. No. 864,334
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—711 **19 Claims**



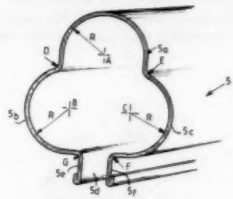
1. In a vehicle having a chassis and an axle, a vehicle suspension system for instatllation between the chassis and the axle comprising, an elongated leaf spring assembly having first and second ends, means for connecting the leaf spring assembly to the axle at a point intermediate the first and second ends, means for supporting the first end of the leaf spring asembly from the chassis with the second end free to move vertically and longitudinally relative to the chassis, a first spring seat, means for joining the first spring seat to the second end of the leaf spring assembly, a second spring seat spaced vertically from the first spring seat, means, for connecting the second spring seat to the chassis, and air spring means connected between the first and second spring seats whereby in addition to functioning as a spring, the leaf spring assembly functions as a beam extending from the first end to the axle and to the air spring means.

4,691,938

GUIDING RAIL OF USE IN PARTICULAR IN A PASSIVE SAFETY BELT DEVICE FOR A MOTOR VEHICLE

Jean Monsigny, Saverne, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Feb. 18, 1986, Ser. No. 829,887
Claims priority, application France, Feb. 15, 1985, 85-02235
Int. Cl.[4] B60R *22/06*
U.S. Cl. 280—804 **6 Claims**



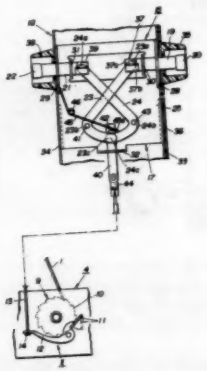
6. A passive safety belt device, in particular for a motor vehicle, comprising a guiding rail having a slot and in combination with a slidable element which is slidable in the rail and connected to a bolt which projects through the slot for cooperation with a passive safety belt buckle, said rail comprising, at least in a part thereof guiding the slidable element, two lateral portions for guiding the displacement of the slidable element and disposed on each side of said slot, and a bearing portion for the slidable element disposed in facing relation to said slot, and wherein said lateral guiding portions are constituted, in section, by substantially semi-circular lobes disposed on each side of said slot and said bearing portion is constituted, in section, by a substantially semi-circular lobe disposed in facing relation to said slot.

4,691,939

RELEASE SYSTEM FOR SEAT OCCUPANT IN VEHICLE

Yoshimi Sato, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 22, 1985, Ser. No. 790,157
Claims priority, application Japan, Nov. 14, 1984, 59-240334; Nov. 28, 1984, 59-181194[U]
Int. Cl.[4] B60R *22/36*
U.S. Cl. 280—806 **18 Claims**



1. A release system for a seat occupant restrained by a seat belt in a vehicle, comprising:

a seat belt retractor having a lock locking said seat belt

retractor when a vehicle body experiences more than a predetermined degree of deceleration;

means for emergency-releasing said seat belt retractor after said seat belt retractor has been locked; and

an emergency release control comprising:

(a) a chassis mounted on the vehicle body,

(b) a manually actuated inboard slider slidably mounted on said chassis,

(c) a first L-shaped control lever pivotably mounted at an angle thereof on said chassis, said first L-shaped control lever having a relatively long arm pivotally linked with said inboard slider and having a relatively short leg,

(d) a manually actuated outboard slider slidably mounted on said chassis,

(e) a second L-shaped control lever pivotably mounted at an angle thereof on the chassis, said second L-shaped control lever having a relatively long arm pivotally linked with said outboard slider and having a relatively short leg, and

(f) a control terminal movable to exert a control power for actuating said emergency-releasing means, said control terminal being actuably associated with said short leg of said first and said second L-shaped control levers, respectively.

4,691,940

PRINTED SECURITY WITH HALLMARKS

Gerhard Stenzel, Munich, and Wittich Kaule, Gauting, both of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 293,761, Aug. 17, 1981, abandoned, which is a division of Ser. No. 82,266, Oct. 5, 1979, abandoned. This application Jan. 2, 1985, Ser. No. 688,209

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845401

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—70 **17 Claims**

1. In a method for verifying the authenticity of a security paper comprising a single-layer, sheet-like paper substrate and a coating applied to an outer surface of said security paper by cathode sputtering, the steps comprising cathode sputtering a coating consisting essentially of a fluorescent substance which emits light in a first spectral range when excited by light of a second spectral range onto a surface portion of said paper substrate; exposing said coating to light of a within said second spectral range; measuring the light emission of said substance as a result of such light exposure; verifying the substance of said coating from such measurement, and thereby verifying the authenticity of said security paper.

2. In a method for verifying the authenticity of a security paper comprising a single-layer, sheet-like paper substrate and a coating applied to an outer surface of said security paper by cathode sputtering, the steps comprising cathode sputtering a coating consisting essentially of a photoconducting substance having a measurable electrically conductive property when exposed to light of a certain spectral range onto a surface portion of said paper substrate; exposing said coating to light within said certain spectral range; measuring the electrical conductivity of said coating while exposed to said light; verifying the substance of said coating from such conductivity measurement and thereby verifying the authenticity of said security paper.

4,691,941

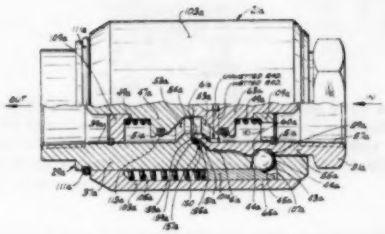
TENSION ACTUATED UNCOUPLER

Charles Rabushka, 1359 Whispering Pines, St. Louis, Mo. 63141, and Layton J. Reprogle, 4430 Eminence, Berkeley, Mo. 63134

Continuation-in-part of Ser. No. 619,120, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,242, Feb. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 401,083, Jul. 23, 1982, abandoned. This application Aug. 2, 1985, Ser. No. 761,865

Int. Cl.[4] F16L *37/10*

U.S. Cl. 285—1 **7 Claims**



1. Tension actuated uncoupler installable in a line for permitting the flow of a fluid therethrough when coupled and for uncoupling at least a portion of said line from another portion thereof in the event a tension load above a predetermined limit being applied to said line, said uncoupler comprising a female quick disconnect fitting secured to one of said line portions and a male quick disconnect fitting secured to the other portion of said line, said male and female fittings each having a flowpath therethrough which, when said fittings are coupled, permits the flow of fluid through said line, a plurality of apertures in said female fitting, a plurality of securing balls carried by said female fitting, one said ball in a respective aperture, said balls being engagable with said male fitting for positively holding the fittings together in coupled relation, said balls being movable radially inwardly and outwardly relative to said male fitting for holding the fittings together in coupled relation and for permitting uncoupling thereof, respectively, cam means on said male fitting cammingly engagable with said balls, a retainer having cam means and being movable axially relative to said female fitting from a retaining position in which said balls are cammingly engagable with said male fitting and with said cam means on said retainer for holding said fittings in coupled relation and a retracted position permitting said balls to move radially thereby to permit uncoupling of said fittings, said retainer being cammingly engaged by said balls upon a tension load being applied to said fittngs, and spring means resiliently biasing said retainer in axial direction toward its retaining position, a seal carried by one of said fittings for sealingly engaging the other fitting upon the fittings being secured together in said coupled relation and upon said fittings moving axially into and out of said coupled relation, said seal being so located with respect to the centerline of said fittings that the cross sectional area of said flowpaths of said fittings are substanially equal to the cross sectional area of seal means so that upon the application of axial tension loading to said fittings, said predetermined load limit being substantially unaffected by fluid pressure within said uncoupler.

4,691,942

HOSE QUICK COUPLING APPARATUS

Michael B. Ford, General Delivery, Vernal, Utah 84078

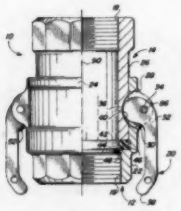
Filed Aug. 13, 1986, Ser. No. 896,599

Int. Cl.[4] F16L *37/18*

U.S. Cl. 285—84 **18 Claims**

1. A quick-disconnect cam locking safety coupling having a hollow male plug with an external peripheral groove, a hollow

socket receiving said male plug and forming said coupling, said socket having a pair of opposed side openings aligned with said peripheral groove; mounting ears on opposed sides of the opening; means, including a gasket, for sealing between the male plug and the socket; a pair of cam members each having a lever extending therefrom and lying adjacent the socket with there being a cam portion passing through one of said side openings and engaging said peripheral groove; a shaft supported by said ears by which each of said cam members are pivotally connected to the socket for outward movement of the levers away from the socket to disengage the cam portions from the said peripheral groove; the improvement comprising:



a bore formed through said cam member, said bore communicates with said shaft and is perpendicular thereto; a detent formed in said shaft adjacent said bore, a piston reciprocatingly received within said bore, biasing means urging said piston towards the detent;

said shaft is non-rotatably supported by said ears, said cam member pivots about the fixed shaft;

said bore and detent are oriented respective to said socket whereby said cam member is releasably locked when the lever is moved against the socket.

4,691,943

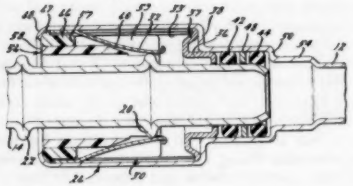
QUICK CONNECT FLUID FITTING ASSEMBLY

Daniel L. DeLand, Millington, and Leon F. LaVene, Durand, both of Mich., assignors to Schmelzer Corporation, Flint, Mich.

Continuation-in-part of Ser. No. 726,839, Apr. 24, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 897,608

Int. Cl.[4] F16L *21/00*

U.S. Cl. 285—315 **13 Claims**



1. A quick-connect fitting assembly for releasably connecting a pair of fluid conduits to one another for fluid communication therebetween, said quick-connect fitting assembly comprising:

socket means on a first of the fluid conduits for receiving a second of said fluid conduits inserted longitudinally inwardly into said socket means, said second fluid conduit having a laterally-extending protuberance thereon;

retainer means within said socket means for releasably retaining said second fluid conduit within said socket means, said retainer means including one or more resilient finger members disposed within said socket means and being resiliently deflectable into a longitudinally interlocking engagement with said protuberance as said second fluid conduit is inserted into said socket means;

removal means longitudinally insertable into said socket means and being selectively movable longitudinally inwardly from a predetermined longitudinal position therein for urging said finger members out of said interlocking engagement with said protuberance, said removal means including longitudinally-extending legs thereon, means for limiting the longitudinal movement of said removal means within said socket means, and lateral guidance means for substantially preventing lateral movement of said removal means as said removal means is moved longitudinally within said socket means, said lateral guidance means including circular segments on said retainer means disposed circumferentially between said finger members, said longitudinally-extending legs on said removal means being disposed adjacent said cylindrical segments of said retainer member for slidable contact therewith; and

lateral support means for laterally supporting said second fluid conduit relative to said socket means at longitudinal position outward of said finger member.

4,691,944

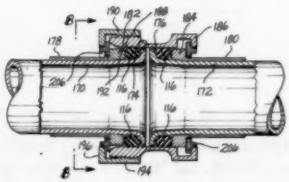
TUBING CONNECTOR

Wilton S. Viall, Jr., Des Moines, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 22, 1986, Ser. No. 866,123

Int. Cl.[4] F16L *19/02*

U.S. Cl. 285—348 **13 Claims**



1. A tubing connector, comprising:

an elongated section of tubing comprising a cylindrical sidewall defining a central fluid conveying passageway, and an end portion including an outwardly directed radial flange;

means to be joined to said tubing section, in a manner providing a fluid-tight joint between said means to be joined and said tubing section, said means to be joined comprising a tubular member into which the end portion of the section of tubing is received, said tubular member and said tubing section defining an annular space between them;

an elastomeric O-ring in said annular space snugly surrounding said tubing section and contacting the radial flange at the end of the tubing section;

a sliding, O-ring compressing, sleeve, comprising an elongated cylindrical sidewall portion which surrounds said section of tubing, an inner end, an outwardly directed radial flange at said inner end, an inner end surface in contact with the O-ring, and a radial shoulder surface formed where the sidewall portion of the sleeve meets the outwardly directed radial flange;

a pressure exerting means having a radial surface which contacts the radial shoulder surface on said sleeve;

rotatable screw joint means between said tubular member and said pressure exerting means;

wherein in response to a tightening rotation of the screw joint means said pressure exerting means exerts an axial force on the shoulder surface of the sleeve, for moving said sleeve axially against the O-ring, to cause the O-ring to compress axially and expand radially, for sealing between said tubing section and said tubular member;

said tubular member has a threaded axial portion which concentrically surrounds said sleeve, and said rotatable screw joint means has a mating threaded axial portion

which concentrically surrounds the sleeve, and wherein the radial surface on the rotatable screw joint means is an end surface; and

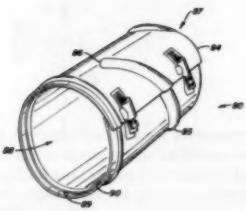
said section of tubing includes a conical region immediately axially inwardly of the radial flange, which increases in diameter as it extends outwardly towards the flange, and wherein the inner end of the sleeve is of such a size and shape that its axial outward movement, in response to a tightening of the screw joint means will be effectively stopped by a tight fit between it and the conical region when the O-ring has been compressed a predetermined desirable amount.

4,691,945

CONDUIT COUPLINGS

Henry L. Cottrell, 4168 W. Fallon, Fresno, Calif. 93722, and William L. Venturi, Oakhurst, Calif., assignors to Henry Lloyd Cottrell, Fresno, Calif.

Filed Oct. 31, 1986, Ser. No. 926,050
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—419 **13 Claims**



1. A coupling for conduits at least one of which is circular tubing having a spiral lock seam protruding outward, said coupling comprising:

a band curved to encircle said circular tubing;

a groove in said band to receive said spiral lock seam and angled to align therewith, said groove having a depth not greater than the distance by which said spiral lock seam protrudes from said circular tubing and a width having a substantially uniform depth exceeding the width of said spiral lock seam to define a gap between said groove and said spiral lock seam on one side of the latter which permits shifting of said groove over said spiral lock seam in a direction transverse to said groove upon tightening said band around said circular tubing; and

means for tightening said band around said circular tubing.

4,691,946

UNIT FOR CONNECTING A SEAT TO MOTOR VEHICLE FLOOR

Luigi Sburlati, Turin; Giovanni Acuto, Orbassano, and Giuseppe Stacchino, Moncalieri, all of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Aug. 6, 1985, Ser. No. 763,129
Claims priority, application Italy, Aug. 9, 1984, 53718/84[U]
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 **8 Claims**

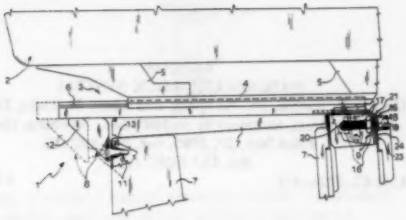
1. A unit for connecting a seat to a motor vehicle foor, comprising guide means resting on a frame fixable to the floor in such a manner as to enable said seat to be supported by said floor and to undergo translational movement relative to said floor;

said guide means comprising two first portions and two second portions;

each of said first portions being fixed to said seat and translatable relative to one of said second portions;

said seat having first and second ends;

each of said second portions being connected to said frame by one positioning means connected between said frame and each of said second portions at one of said ends of said seat and by one locking means connected between said frame and each of said second portions at the other of said ends of said seat; and



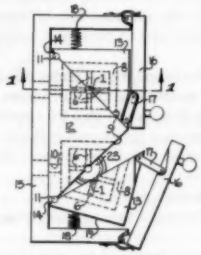
each said locking means including a cooperating screw and a nut, one of which is premounted on a respective bracket fixed to a respective second portion, and the other of which is arranged to engage a corresponding open seating provided in said frame.

4,691,947

YARN TEXTURING NOZZLE

Klaus Burkhardt, Schwelm; Klaus Gerhards; Manfred Greb, both of Hückeswagen; Rainer Keuth, and Erich Lenk, both of Remscheid, all of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 821,260
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501662; Mar. 15, 1985, 3509323
Int. Cl.[4] D02G *1/12, 1/16*
U.S. Cl. 28—255 **22 Claims**



1. A yarn texturing nozzle comprising

a yarn feeding inlet portion comprising a block having a yarn passageway extending therethrough and defining an inlet end and outlet end, and with said block being divided into two parts along a plane extending axially along the passageway so that the two parts may be separated along said plane to facilitate yarn threadup, and with said block further including at least one internal duct communicating with said passageway and being inclined with respect to the axis of said passageway so as to be directed toward said outlet end, and conduit means for connecting said at least one internal duct to a source of a pressurized treatment fluid and such that the pressurized fluid entering said passageway through said internal duct is adapted to advance a yarn through said passageway and toward said outlet end, and

a tubular stuffer box mounted to abut the outlet end of said block in coaxial communication with said outlet end of said passageway, said stuffer box including a peripheral side wall having opening means extending therethrough for permitting the treatment fluid to exhaust laterally

through said side wall, and wherein said stuffer box further includes a yarn inserting slot extending through said side wall to facilitate yarn threadup, and means for selectively closing said yarn inserting slot.

4,691,948

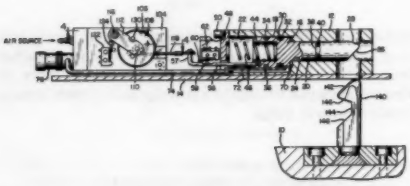
FAIL-SECURE LOCK SYSTEM

George K. Austin, Jr., Newberg, and Larry D. Lietz, Dundee, both of Oreg., assignors to A-DEC, Inc., Newberg, Oreg.

Filed Nov. 27, 1985, Ser. No. 802,533

Int. Cl.[4] E05C *1/12*

U.S. Cl. 292—171 **9 Claims**



1. A lock mechanism for a door or the like comprising:

a frame,

a latch bolt,

a cylinder body fixedly mounted on said frame and slidably receiving the latch bolt for movement between an extended locking position and a retracted unlocked position,

spring means operatively arranged between said body and latch bolt to bias said latch bolt toward said locking position,

said body and latch bolt defining a piston and cylinder means adapted upon the introduction of air therebetween to cause said latch bolt to be urged toward said unlocked position,

conduit means for supplying air under pressure to said piston and cylinder means, said conduit means including a solenoid operated three-way valve for controlling the flow of air to and from said piston and cylinder means,

circuit means connected to said solenoid for effecting operation thereof,

switch means in said circuit,

a mortise lock having a key rotatable plug mounted in said frame,

an operating lever mounted on said plug and operatively connected to said switch to cause the same to close the circuit through said solenoid upon predetermined rotation of said plug whereby said solenoid operates said three-way valve to supply air under pressure to the cylinder body to move said latch bolt toward the unlocked position, said lever causing the switch to open the circuit through said solenoid upon counterrotation of said plug, whereby said solenoid operates said three-way valve to release air from the cylinder body and enable the spring means to bear said latch bolt toward the locking position,

a spool,

means rotatably mounting said spool in said frame,

cable means connected to said latch bolt and to said spool whereby rotation of said spool will cause movement of said latch bolt toward said unlocked position,

and means on said spool for operatively engaging said operating lever as the same is rotated with said key beyond a predetermined degree whereby further rotation of said key and operating lever causes said cable to be wound on said spool and said latch bolt to be moved to said unlocked position.

4,691,949

LOCK ARRANGEMENT FOR A MOTOR VEHICLE DOOR

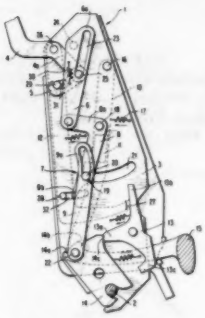
Helmut Grantz, and Wolfgang Odebrecht, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,281

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507405

Int. Cl.[4] E05C *3/26*

U.S. Cl. 292—216 **21 Claims**



1. A lock arrangement for a motor vehicle door, comprising lock housing means including rotary catch means rotatable to an open and locked position and acting on a locking bolt on a side of a vehicle body, a spring-loaded locking latch means holding the rotary catch means in a locked position, a knee lever means engaging at the catch means and at the housing means which is formed by two lever members connected in a deflectable dead-center joint means, and actuating means, two end positions of the dead-center joint means are coordinated to the locked and open position of the rotary catch means are determined by control abutment means limiting the deflection of the dead-center joint means, a torque being introduced into the rotary catch means by means of the actuating means moving the knee lever means to deflect the dead-center joint means, by means of which the door is adapted to be transferred into the locked position against the force of an elastically deformable door seal, the knee lever means being displaceable by means of a pivotally supported pull handle, which is spring-loaded against an outward pivoting direction to deflect the dead-center joint means, from the end position of the dead-center joint means which is coordinated to the open position of the catch means, into the end position of the dead-center joint means which is coordinated to the locked position of the rotary catch means by pivoting-in the pull handle.

4,691,950

DEVICE FOR DETACHABLY SECURING PIVOTALLY CONNECTED MEMBERS IN A PREDETERMINED RELATIVE POSITION

Siegfried Mayer, Münster-Wolbeck, and Paul Greisner, Telgte, both of Fed. Rep. of Germany, assignors to Aug. Winkhaus GmbH & Co. KG

Filed May 27, 1986, Ser. No. 867,912

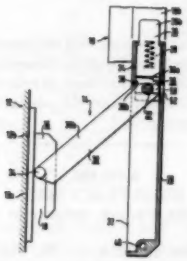
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521492

Int. Cl.[4] E05C *17/16*

U.S. Cl. 292—269 **12 Claims**

1. A device for detachably securing pivotally connected first and second members in a predetermined relatively open position into which they have been moved from a relatively closed position, the said device comprising a slide guide having a longitudinal direction adapted to be secured to the first member; a sliding member slidable in the longitudinal direction of

said slide guide; resilient means in contact with the sliding member for urging the sliding member towards a normal position in the slide guide; a swivel joint carried by said sliding member; a rectilinearly extending swivel-slide joint fitting adapted to be secured to the second member; a bar one end of which is connectdd to the swivel joint and the other end of which is rectilinearly slidably connectable to and disconnectable from the swivel-slide joint fitting; a releasing and locking cam located on the bar, the slide guide having a cam-engaging edge therein which is engageable with the cam so as automatically to lock the bar in a predetrmined angular position only when the bar has been moved into the latter in a predetermined direction as a result of the first and second members having been moved into the said relatively open position; the cam having a cam surface which cooperates with the cam-engaging edge during the movement of the bar in the said predetermined direction to cause movement of the sliding member against the



action of the resilient means until the bar is in the said predetermined angular position; and said sliding member includes a manually operable releasing means for effecting sliding movement of the sliding member away from the said normal position and against the action of the resilient means to release the cam from the cam-engaging edge and thus permit the bar to be swivelled around the swivel joint so that the first member may be moved from the relatively open to the relatively closed position; the bar being disconnectable from and removable out of a slot of the swivel-slide joint fitting when the first and second members are in the relatively closed position by moving the sliding member out of its normal position against the action of the resilient means; the bar being formed of two sections which are parallel to each other and which at one end receive the sliding member between them and at the other end are connected by a slot-engaging bolt, the swivel-slide joint fitting having a portion engaging between the two sections.

4,691,951

BOLT ASSEMBLY FOR A DOOR SET

Gerhard Fildan, D-7250 Leonberg, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,441

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 8529711[U]; Dec. 30, 1985, 8536672[U]

Int. Cl.[4] E05C *1/16*

U.S. Cl. 292—337 **18 Claims**

1. A bolt assembly for a door set, said assembly comprising:

a bolt guide sleeve;

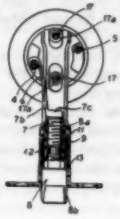
a bolt pin mounted to be axially displaceable in said sleeve, said bolt pin having a latching head adapted to project from said sleeve and engage in a recess, and a tubular shank extending from said head in said sleeve;

a coil spring disposed in said sleeve and bearing against said head for yieldably urging said head out of said sleeve;

a screw threadedly engaged in said shank and axially displaceable therein by rotation of said screw relative to said bolt pin;

at least one knob rotatably mounted on said assembly; and

an eye formed unitarily on said screw and extending therefrom away from said head for engagement with a formation connected to said knob and excentric with respect to



an axis of rotation thereof whereby rotation of said knob can displace said head against a force of said spring.

4,691,952

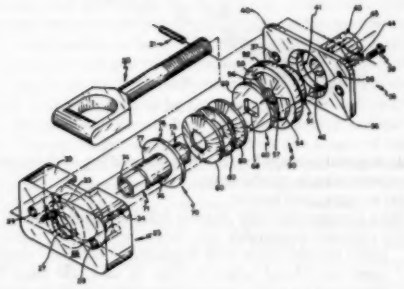
CLUTCHING ADJUSTABLE KEEPER MECHANISM

Raymond E. Harmon, Orange, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Filed Oct. 6, 1986, Ser. No. 915,588

Int. Cl.[4] E05B *15/02*; E05C *3/04*

U.S. Cl. 292—341.18 **2 Claims**



1. A mechanism for adjusting a load applied through a keeper in a tension latch assembly, said mechanism comprising:

a housing;

a drive system constructed and arranged to react against said housing for adjustment of the keeper relative to a fixed-position hook in a latch assembly; and

means for preventing said drive system from effecting additional adjustment of the keeper when a pre-determined load is achieved between the keeper and the hook;

said housing having a first portion, and a second portion separate from said first portion, said second portion being secured to said first portion;

said drive system including:

a nut having a first bearing surface and a second bearing surface for reacting against said first housing portion and said second housing portion respectively, and a threaded through-hole constructed for engagement with a threaded portion of the keeper, and

a drive element having a through-hole therein through which the keeper extends for movement relative thereto, a surface constructed and arranged so as to be contained within and to bear against said first housing portion, and a portion accessible externally from said housing and constructed for effecting adjustment of the keeper;

said means for preventing said drive system from effecting additional adjustment of the keeper including:

said nut having a free end surface and at least two recessed areas thereon,

a backing plate constructed for rotational movement with said drive element, said backing plate having at least two raised surface areas each constructed to be engaged with one of said nut recessed areas, and a ramp surface formed integral with each of said raised surface areas, and

spring means, intermediate said backing plate and said drive element surface, for applying a pre-determined static spring load,

said backing plate ramp surfaces being constructed and arranged to permit said backing plate to disengage from said nut when a pre-determined load between the keeper and the hook, achieved by operation of said drive system, exceeds said spring means pre-determined static spring load.

4,691,953

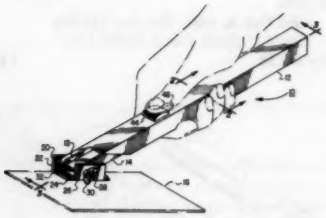
SHEET GRIPPER TONGS

Bruce O. Kofoed, 7347 Elmridge Dr., Dallas, Tex. 75240

Filed Apr. 15, 1986, Ser. No. 852,191

Int. Cl.[4] B25J *1/02*

U.S. Cl. 294—19.1 **13 Claims**



1. A portable tongs for the gripped handling of sheet materials comprising in combination:

(a) an elongated handle;

(b) a plunger coaxially slidable relative to said handle;

(c) opposed cooperable jaw faces for defining a gripping plane therebetween and displaceable between relatively open and closed positions, one of said jaw faces being contained on a first jaw unit supported at the lower distal end of said handle and the other of said jaw faces being contained on a second jaw unit supported at the lower distal end of said plunger;

(d) actuator means to manually operate said jaw units relatively toward and away from each other between the closed and open positions respectively of their respective jaw faces; and

(e) support means separately supporting each of said jaw units for rotatable displacement about a respective axis extending substantially normal to the longitudinal axis of said handle, said support means enabling arcuate displacement of the jaw faces and their effected gripping plane about the axes of said support means for presetting a preferred angular orientation between the gripping plane of said jaw units and the longitudinal axis of said handle.

4,691,954

SNOW SHOVEL

Ronald J. Shaud, 722 Madison Ave., Reading, Pa. 19610

Filed Aug. 15, 1986, Ser. No. 896,975

Int. Cl.[4] B25G *1/04*; E01H *5/02*

U.S. Cl. 294—54.5 **2 Claims**

1. A snow shovel comprised of a handle and a shovel blade attached at one end of the handle

the handle comprising a pair of elongated telescoping tubular members configured and dimensioned to mate in intimate axial sliding relationship one to another;

an elongated compression spring contained within the tubular members having a first end secured to one of the pair of telescoping tubular members and a second end secured to the other of the pair of tubular members;

whereby, when an axial force is applied in the direction of the blade to the tubular member that is remote from the

blade, the tubular members will telescope with respect to each other against the bias of the compression spring and, conversely, when the axial force is relieved, relaxation of the compression spring urges the tubular members toward an extended position.

4,691,955

RIGID PLACE MAT

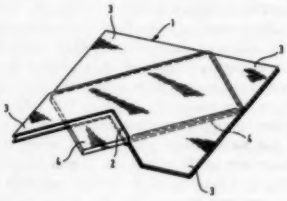
Kurt Pousár, Helsinki, Finland, assignor to Oy Wärtsilä Ab, Helsinki, Finland

Filed Jun. 18, 1986, Ser. No. 875,629

Claims priority, application Finland, Jun. 25, 1985, 852498

Int. Cl.[4] B65D *73/00*

U.S. Cl. 294—142 **14 Claims**



1. A rigid place mat, which can be used as an individual tray or support for dishes or drinking vessels on a table or in the lap, comprising a flexible sheet-form member in which there is formed a pouch-like case, and a rigid plate arranged in the pouch-like case as a stiffener.

4,691,956

COUNTERBALANCED TAILGATE FOR DUMP BOXES

Harold F. Hodge, Santa Clara, Calif., assignor to Cook's Truck Body Mfg., Inc., Santa Clara, Calif.

Filed Aug. 12, 1985, Ser. No. 753,641

Int. Cl.[4] B62D *25/00*

U.S. Cl. 296—51 **7 Claims**

1. In a tail gate assembly for closing the rear end of a dump box including a generally rectangular gate means, upper attachment means for releasably and pivotally attaching the top of the gate to each side wall of the dump box, and lower attachment means for releasably and pivotally attaching the bottom of the gate to each said side wall, an improved lower attachment means comprising:

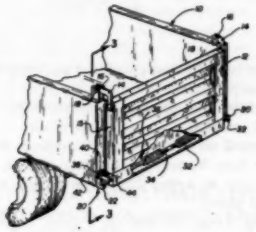
selectively actuatable pawl means disposed generally interiorally of the rearmost and lowermost extremities of each said side wall, each said side wall having a rearwardly facing opening provided therein proximate said pawl means, and support and pivot bracket means extending

rearwardly from the lower most extremity of each said side wall with shaft receiving socket means formed therein;

shaft means having end portions extending through the lower extremity of each side of said gate and along a longitudinal axis lying parallel to a plane including a face of said gate, said shaft means being rotatable about said longitudinal axis and carried by said gate;

resilient means disposed within said gate and coupled between said shaft means and said gate and operative to apply a torsional counterbalancing force between said shaft means and said gate; and

elongated latch arm means rigidly affixed to said end portions of said shaft means and extending forwardly and generally normal to said plane, said arm means being



positioned on said shaft means so as to extend through said openings when the outermost extremities of said end portions of said shaft means are engaged with said socket means, said arm means having notches formed therein and disposed proximate the foremost portions thereof for facilitating locking engagement with said pawl means, whereby when said upper attachment means is detached and said pawl means and arm means are engaged, the top of said gate may be rotated downwardly about said shaft means with said resilient means providing said torsional counterbalancing force thereto, and when said upper attachment means is attached and said pawl means is disengaged from said arm means, the bottom of said gate may be rotated upwardly, pivoting about said upper attachment means and withdrawing said arm means from said openings.

4,691,957

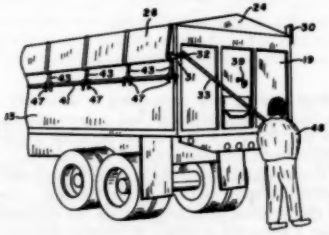
ROLL-TIGHT TARP SYSTEM

Hartley Ellingson, Wahpeton, N. Dak., assignor to Frontier, Inc., Wahpeton, N. Dak.

Continuation of Ser. No. 725,658, Apr. 22, 1985, abandoned, which is a continuation of Ser. No. 476,118, Mar. 17, 1983, abandoned. This application Sep. 8, 1986, Ser. No. 904,800

Int. Cl.[4] **B60P** *7/04;* **B65D** *43/26*

U.S. Cl. 296—98 **31 Claims**



1. A tarp assembly for an open top container having a pair of generally parallel, longitudinal first and second side walls with upper edges at least partially defining the top opening of the container, said tarp assembly comprising:

a tarp having a longitudinal dimension longer than the longitudinal dimension of the top opening and a lateral dimension greater than the distance between the container side walls; said tarp having a first longitudinal edge secured to the first side wall and a movable second longitudinal edge extendable in overlapping relationship to the second side wall; first means for securing the first longitudinal edge of the tarp to the first side wall; rigid linear means having a bottom wall portion and side wall portions spaced from a longitudinal axis thereof, second means securing the movable second longitudinal edge of the tarp to a bottom wall portion of the linear means, means for selectively rotating the linear means about the longitudinal axis in a first direction to unroll the tarp from the linear means to cover the open top of the container, rotating the linear means in a second direction to roll up the tarp on the linear means to uncover the open top of the container, said second direction being opposite the first direction, and selectively holding the linear means and tarp rolled thereon in a first position covering the open top of the container and a second position uncovering the open top of the container; hold means fixed to the movable second longitudinal edge of the tarp; said hold means including a longitudinal hold bar, and strap means connected at one end thereof to the hold bar and connected at the other end thereof to the bottom wall portion of the rigid linear means with said second means holding a vertically depending portion of the strap means in horizontal offset relationship to the longitudinal axis and to a vertically depending portion of the tarp when the tarp is fully unrolled; downwardly open hook means adapted to be fixed to an outside surface of the second side wall; said hook means comprising a plurality of hooks longitudinally spaced along the length of the second side wall to guide the strap means and retain the hold bar in alignment for mutual engagement with said hooks, said hooks being positioned in pairs to straddle the strap means when the tarp covers the container opening, said strap means being of sufficient length to position the hold bar beneath the hook means with the rigid linear means above the hook means when the tarp is fully rolled; said hold bar being engageable with said hook means to retain the tarp in the closed position upon continued rolling of the tarp on the linear means in the first direction after the tarp has been fully unrolled, and releasable from the hook means upon unrolling of the tarp from the linear means in the second direction.

4,691,958

DOOR STOP AND LATCH

Mahlon A. Miller, Nappanee, Ind., assignor to Newmar Corporation, Nappanee, Ind.

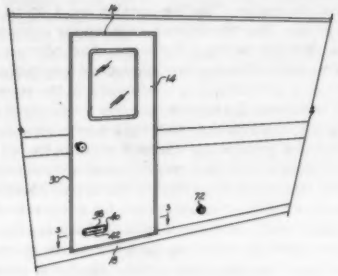
Filed Feb. 2, 1987, Ser. No. 930,733

Int. Cl.[4] **B60R** *3/00;* **E05C** *17/04*

U.S. Cl. 296—146 **9 Claims**

1. In combination a vehicle including a side wall having a door opening and an access door spanning said opening swingable between open and closed positions, and a latch means associated with said door and structure side wall for securing the door in its open position, said latch means comprising a latch pin swingably mounted to one of said door and structure sidewall between a retracted position within said one door and

side wall and an extended position projecting outwardly of the one door and side wall, stop means located on the other of said



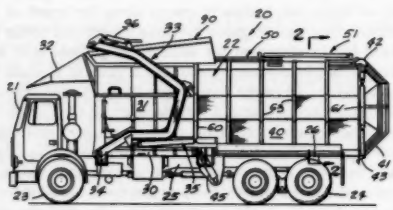
door and side wall for accepting said latch pin in an interlock fashion when the latch pin is in its said extended position.

4,691,959

REFUSE PICKUP AND COMPACTOR BODY

Verner Michael L., Norwalk, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.

Division of Ser. No. 754,521, Jul. 12, 1985, Pat. No. 4,648,775.
This application Oct. 15, 1986, Ser. No. 919,013
Int. Cl.[4] B60P *1/00*
U.S. Cl. 296—184 **6 Claims**



1. In a refuse compactor body, the improvement comprising:
a parallel pair of longitudinally extending floor beams for a tank of the body;
a plurality of rectangular metal sheets of a high tensile strength including some sheets which have been bent to define a polygonal wall for a tank of said body;
said tank having at least six flat sides defining a uniform polygonal right section of said tank from end to end;
a series of girth reinforcements for said wall that are axially spaced apart along the length of said tank;
each of said reinforcements comprising a series of rigidly end-to-end interconnected short straight sections of a stiff material completely peripherally embracing said flat sides of said tank in the same polygonal shape as said wall;
each of said reinforcements being rigidly interconnected with said pair of beams;
said bent sheets having bends on bend lines extending transversely of the direction of final rolling of the sheet;
the direction of rolling of the bent sheet being oriented in the direction of said girth reinforcements;
the maximum angle of bend of said bent sheets being less than the angle at which a sheet of the guage and high tensile strength of the sheet would crack at the line of bending during cold bending.

4,691,960

CONSOLE BOX FOR AUTOMOBILE

Kazuhiko Miyadera, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 23, 1986, Ser. No. 854,769
Claims priority, application Japan, Apr. 25, 1985, 60-62544
Int. Cl.[4] B60R *7/00*
U.S. Cl. 296—37.8 **8 Claims**

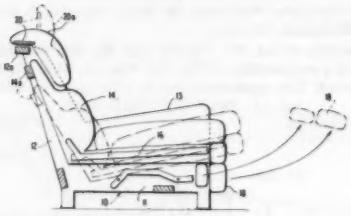
1. A console box divided into front and rear blocks for an automobile comprising:
a front block secured to an automotive body;
a rear block coupled with said front block;
a flange formed on a rear edge of said front block;
at least one boss formed on an inner surface of said front block having an upper flat surface lying in a generally horizontal plane;
an extending flange formed on a front edge of said rear block;
a groove formed on an upper surface of said extending flange for engaging with the flange of said front block;
at least one guide rib formed on said rear block having a surface contacting with said upper surface of said at least one boss, wherein
said front and rear blocks of the console box are integrally coupled in position by engaging the flange with the groove, and contacting the upper flat surface of the at least one boss with the surface of the at least one guide rib.

4,691,961

RECLINER WITH HEADREST

Walter C. Rogers, Jr., Denton, and Raymond E. Holobaugh, Jamestown, both of N.C., assignors to Parma Corporation, Denton, N.C.

Filed Feb. 14, 1986, Ser. No. 829,209
Int. Cl.[4] A47C *1/036*
U.S. Cl. 297—61 **9 Claims**



1. A recliner seating unit comprising a stationary frame including a base, a movable seat and a movable backrest mounted on the frame for movement between a generally upright position and a reclined position, said stationary frame including a fixed backrest mounting portion located above the base and behind an upper portion of the backrest, a headrest mounted to the headrest mounting portion for pivotal movement between a retracted generally horizontal position when the backrest is in the upright position and an extended generally vertical position overlying the backrest when the backrest is in the reclined position, and means for pivoting said headrest

about a first axis located at a forward portion of the headrest mounting portion for moving the headrest between said retracted and extended positions upon movement of the backrest between said upright and reclined position, and wherein said headrest generally overlies and headrest mounting portion when in the retracted position and projects vertically upwardly from the headrest mounting portion when in the extended position, and said headrest positions are spaced from each other approximately ninety degrees, and wherein said means for actuating said headrest includes a linkage interconnecting the backrest and the headrest, and wherein said linkage includes a first bracket link fixed to the headrest, a second bracket link fixed to said fixed headrest mounting portion and extending forwardly of said headrest mounting portion for providing said first axis about which said headrest pivots, said first bracket link being pivotally mounted to said second bracket link at said first axis, a crank pivoted intermediate its ends to said second bracket link for rotational movement about a second axis spaced from said first axis relative to the headrest mounting portion, a link pivotally interconnected between one end of said crank and said first bracket link on one side of said second axis, and a link pivotally interconnected between the other end of said crank and the backrest on the opposite side of said second axis.

4,691,962

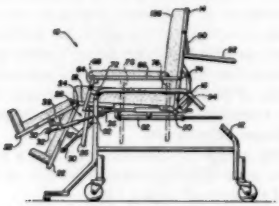
CONVERTIBLE WHEELCHAIR/LITTER

Donald H. Holdt, Cambridge, Md., assignor to Cambridge Technologies, Inc., Cambridge, Md.

Division of Ser. No. 673,850, Nov. 21, 1984. This application Jul. 16, 1986, Ser. No. 886,008

Int. Cl.⁴ A47C *1/02*

U.S. Cl. 297—84 **17 Claims**



1. In seating equipment, the combination comprising upholstered cushion means, means to permit rapid assembly and disassembly of said upholstered cushion means from said seating equipment without the use of tools, said seating equipment comprising frame portions cooperable with said upholstered cushion means, said assembly and disassembly means comprising pin means on said upholstered cushion means and tab means formed with openings adapted to receive said pin means, means to mount said tab means on said cooperating frame portions, and manually removable locking means to removable secure said pin means in said openings in said tab means, whereby said assembly and disassembly means comprises quick release holding means between said upholstered cushion means and said cooperating frame portions.

4,691,963

TANDEM SEAT FOR A TWO-WHEELED VEHICLE

Kunio Mikuniya, and Akira Kojima, both of Akishima, Japan, assignors to Tachikawa Spring Co. Ltd., Tokyo, Japan

Filed Aug. 22, 1985, Ser. No. 768,448

Claims priority, application Japan, Aug. 30, 1984, 59-132555[U]; Aug. 31, 1984, 59-133281[U]

Int. Cl.⁴ B62J *1/00*

U.S. Cl. 297—195 **2 Claims**

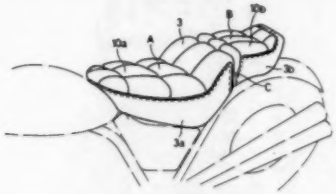
1. In a tandem seat for a two-wheeled vehicle having a bottom with lateral side portions, a pad placed onto said bottom, and a trim cover assembly for covering said pad, said trim cover assembly including a front seat section, a rear seat section integrally formed with said front seat section, and an interface portion formed between said front and rear seat sections,

the improvement comprising:

a front pad portion formed in said pad in such dimensions as to correspond to dimensions of said front seat section;

a rear pad portion formed in said pad in such dimensions as to correspond to dimensions of said rear seat section;

an interface portion defined between said front and rear pad



portions and having a first recessed groove formed thereat so as to extend along a transverse direction of said front and rear pad portions;

said lateral side portions of said bottom having second recessed grooves extending in a direction perpendicular to said transverse direction of said first recessed groove;

said front and rear seat sections of said trim cover assembly, having formed therebetween an inverted U-shaped connecting portion extending along said interface portion of said trim cover assembly, whereby said connecting portion of said trim cover assembly is thrust into and engaged with both said first and second recessed grooves.

4,691,964

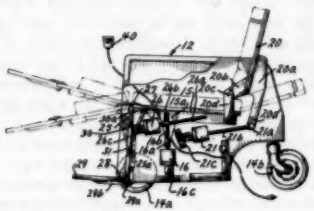
POWERED RECLINING CHAIR

John A. Morgan, 2911 Coal Mine Rd., Newburgh, Ind. 47630

Filed Jun. 30, 1986, Ser. No. 880,591

Int. Cl.⁴ A47C *1/02*

U.S. Cl. 297—330 **4 Claims**

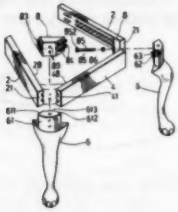


1. A powered reclining chair comprising a framework mounting a seat portion, a back portion and a leg portion, and independent electrical motors operatively connecting each of said portions in a selective positioning relationship, where said leg portion includes a foot section pivotal to and from a normal and an in-line position with respect to the longitudinal direction of said leg portion, and where said pivotal movement of said foot section is accomplished by structure including a hinge connecting said leg portion and said foot portion, a support member disposed on the rear surface of said leg portion, a control member slidable on said support member in response to pivotal movement of said leg portion from a first position maintaining said foot section in a normal relationship with said leg portion to a second position releasing said foot section to an in-line relationship with said leg portion.

4,691,965
JOINT ARRANGEMENT FOR KNOCKDOWN FURNITURE

Shu-Jen Hsiung, No. 549, Hsin Shu Road, Hsin Chuang City, Taipei Hsien, Taiwan

Filed Sep. 12, 1986, Ser. No. 906,447
Int. Cl.[4] A47C 7/00
U.S. Cl. 297—440 3 Claims

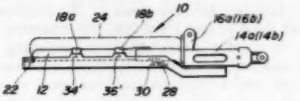


1. An improved knockdown chair, including a back rest frame having two back legs integrally formed therewith; a plurality of substantially trapezoidal joint pieces; a quadrilateral seat support member for supporting a seat having a back support fixed on said back rest frame at an appropriate location for a seat, a front support and two side supports, each support having two end faces, said seat support member extending perpendicularly from said back frame; and front legs extending downward respectively from said seat support member at two ends of said front support, said supports being attached at respective said end faces thereof to said back frame and said front legs with said joint pieces in a joint arrangement wherein said joint arrangement comprises one of said legs of said chair having two mounting surfaces at lateral sides thereof; a pair of said side supports each attached perpendicularly at one end face thereof to one of said mounting surfaces therefore providing two inward faces forming an angle therebetween; one of said trapezoidal joint pieces having two side surfaces conforming to said angle for being screw attached to said seat support member; and a guiding means comprising a ridge on one of said side surfaces and said inward faces and a corresponding groove on the other of said side surfaces and said inward faces, whereby said joint piece can be positioned easily and accurately during assembly to strengthen said joint said supports and said legs being respectively attached by attaching means, each attaching means being disposed in and between one of said supports and one of said legs, including a bolt and a cylindrical member, each bolt having a head at one end and a screw thread at another, said cylindrical member having a bolt hole in one end thereof for receiving said bolt and a pin hole in a side of said cylindrical member extending perpendicularly to a longitudinal axis of said bolt hole, means forming a cylindrical hole in one of said mounting surfaces of one of said legs, said cylindrical hole being sized to seat said respective cylindrical member, locking pin means for insertion into said pin hole of said cylindrical member, means forming a longitudinal guide recess in a side of said support near an end thereof, means forming a bolt hole extending from an interior side of said guide recess to an end face of said support respectively, a longitudinal axis of said recess being parrallel to a longitudinal axis of said bolt hole, said bolt hole being sized to receive said threaded portion of said bolt, said guide recess being sized to allow passage of said threaded portion of said bolt and receive said head portion in a deep portion thereof away from the surface of the support, whereby, said bolt may be inserted into said bolt hole and received in said cylindrical member seated in said leg, and said head will rest inside the guide recess of said support, completely out of sight.

4,691,966
SEAT WITH GARNISHED SEAT CUSHION

Hidekazu Maruyama, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 25, 1986, Ser. No. 878,238
Claims priority, application Japan, Aug. 6, 1985, 60-120758[U]
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—452 8 Claims



1. A seat cushion assembly of a seat, comprising:

a generally rectangular frame including a front portion, two side portions and a rear portion;

a seat cushion including a cushion material and a skin member which covers said cushion material, said seat cushion being mounted on said frame with said skin member covering said front portion of said frame;

a zig-zag wire of resilient material including a first series of protrusions protruding in one direction, a second series of protrusions protruding in the other direction and intermediate portions interconnecting the first and second series of protrusions, said second series of protrusions being secured to said front portion of the frame having said first series of protrusions pressed against a rear surface of said skin member, thereby to provide the skin member with a plurality of outwardly raised portions;

a generally rectangular garnish of plastics arranged to conceal portions of said frame and said seat cushion, said garnish including a rectangular flat portion and a bank portion, said bank portion being formed at the inboard side thereof with a recess into which said outwardly raised portions of said skin member are snugly received, said recess extending in a direction generally parallel to said front frame portion; and

connecting means for connecting at least a portion of said garnish other than the recessed portion or the bank portion of the garnish to said frame.

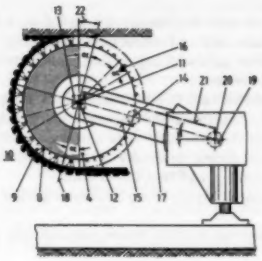
4,691,967
APPARATUS FOR CONTROLLING THE DISCHARGE OF PRESSURIZED LIQUID FROM NOZZLES ON A CUTTING DRUM OF A MINING MACHINE

Herbert Schupphaus, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik and Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,224
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441397
Int. Cl.[4] E21C 35/22, 25/60; E21F 5/02
U.S. Cl. 299—1 25 Claims

1. In a mining machine used in underground mining, the combination of a cutter drum, nozzles distributed in rows about the periphery of said drum for discharging pressurized liquid outwardly from said drum, liquid control valve means for controlling the supply of pressurized liquid to each nozzle or a group of nozzles, at least one initiator means responsive to rotation of said drum for producing a signal, and microproces-

sor means responsive to the signal produced by said initiator means for controlling said valve means for limiting the discharge of pressurized liquid from said nozzles toward only that part of the mineral face which is in front of said drum.

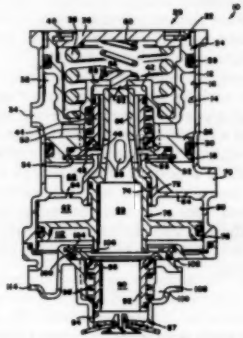


4,691,968

DUAL CIRCUIT BRAKE VALVE

James G. Pugh, Elyria; Duane R. Johnson, Oberlin, and Roy E. Bartholomew, Elyria, all of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 24, 1986, Ser. No. 831,891
Int. Cl.[4] B60T *15/06*
U.S. Cl. 303—52 **10 Claims**



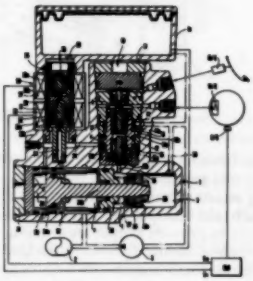
1. Dual brake valve comprising a housing having a pair of inlets, a pair of outlets, and an exhaust, said housing defining a stepped bore therewithin having larger and smaller diameter portions, an operator-actuated stepped plunger assembly slidably mounted in said bore having larger and smaller diameter sections slidably engaged with the larger and smaller diameter portions of the bore, a first set of cooperating valve members mounted in said bore and adapted to control communication between said exhaust, one of said inlets, and a corresponding one of said outlets, a second set of cooperating valve members mounted in said bore and adapted to control communication between said exhaust, the other inlet, and the other outlet, said plunger assembly operating said first set of cooperating valve members to control opening and closing of fluid communication between said one inlet, said exhaust and the corresponding outlet, and means operated by said plunger assembly for operating said second set of cooperating valve members to control communication between said exhaust, the other inlet and the other outlet in accordance with said first set of cooperating valve members, said plunger assembly cooperating with the wall of said bore to define an inlet chamber communicating with said one inlet and presenting a fluid pressure effective area equal to the differential area between the sections of the plunger assembly whereby the fluid pressure level in said inlet chamber acts on the differential area to urge the plunger assembly toward a position establishing a predetermined condition of said first and second sets of cooperating valve members.

4,691,969

ANTISKID CONTROL SYSTEM

Toshifumi Maehara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 896,137
Claims priority, application Japan, Aug. 22, 1985, 60-184572
Int. Cl.[4] B60T *8/42*
U.S. Cl. 303—113 **3 Claims**



1. An antiskid control system for a vehicle, comprising:

a gate valve device inserted in a braking hydraulic pressure transmission line disposed between a master cylinder device and a braking device and is provided with a valve mechanism which receives a pressure fluid from a pressure accumulator and is arranged to close said braking hydraulic pressure transmission line and to initiate communication with said braking device through a branch line;

an electromagnetic valve device including a first solenoid valve which is arranged to normally close a transmission pressure fluid supply line provided for supplying the pressure fluid from said accumulator to said gate valve device and to open said transmission pressure fluid supply line when the pressure of said braking device must be lowered and a second solenoid valve which is arranged to normally open a hydraulic pressure release line to release hydraulic pressure from the pressure fluid input chamber of said gate valve device to a reservoir and to close said release line when the pressure of said braking device must be lowered; and

a braking hydraulic pressure control device including a control fluid chamber connected to said branch line coming from said gate valve device and a control piston arranged to increase or decrease the internal volume of said control chamber approximately in proportion to the value of the hydraulic pressure which is received from the pressure fluid input chamber of said gate valve device.

4,691,970

DUSTPROOF CABINET, IN PARTICULAR FOR ELECTRICAL EQUIPMENT

Armando Neri, Via Napoli 7, 40139, Bologna, Italy

Filed Apr. 7, 1986, Ser. No. 848,475
Claims priority, application Italy, Apr. 12, 1985, 4851/85[U]
Int. Cl.[4] A47F *3/00*; A47B *96/00*
U.S. Cl. 312—257 SK **11 Claims**

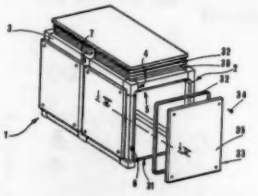
1. A dustproof cabinet for electrical equipment or the like comprising:

a framework of substantially parallelepiped shape including a plurality of outwardly facing openings each substantially in the shape of a parallelogram;

said framework including a plurality of joints and members with each joint having means for detachable interconnection with a plurality of said members so as to form said framework, each joint being located in the framework at a vertex of at least three of said openings;

said cabinet further including fastener means for securing each said member removably and detachably in a respective joint;

a plurality of panels each for mounting over a said opening, said members and joints when assembled providing for



each said opening a peripheral frontal abutment for receiving a said panel;

a mounting means extending continuously about the periphery of each said opening and carried by said members and joints so as to provide support for sealing means; and

dustproof sealing means removably lodged between each said panel and said framework and engaging the entire periphery of each said panel with said respective mounting means preventing outward movement of said respective sealing means with respect of a said panel.

4,691,971

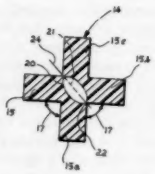
CONNECTOR WITH COMPLIANT RETAINER

Marlyn E. Hahn, York, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 17, 1986, Ser. No. 910,456

Int. Cl.[4] H05K *1/00*

U.S. Cl. 439—78 **2 Claims**



1. An apparatus for locating and holding a connector housing to a printed wiring board having locating holes therein, said apparatus comprising: a post extending from said housing for engaging said holes with an interference fit to locate the housing with respect to said printed wiring board, said post having a plurality of ribs extending outwardly from the post at locations around the post and an elongated longitudinal bore having its major axis aligned with directly opposed junctures of adjoining ribs and sized to provide a frangible juncture which separates when said post is inserted in a locating hole.

4,691,972

SOLDERLESS CONNECTION APPARATUS

Herman B. Gordon, Phoenix, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 707,239, Mar. 1, 1985, abandoned. This application Jun. 10, 1986, Ser. No. 872,709

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—77 **19 Claims**

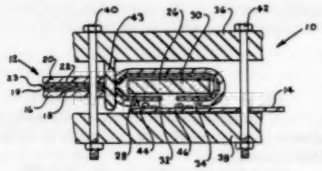
1. In a solderless connector wherein mechanical means applies force against an elastomeric element to effect electrical contact between terminal portions of circuit devices, at least one of the circuit devices being a multi-layer flexible circuit having at least a first and second circuit layer, the improvement comprising:

said first layer of said flexible circuit including a first nonconductive substrate and a first cover film, said substrate and cover film sandwiching a first conductive pattern means therebetween;

said second layer of said flexible circuit including a second nonconductive substrate and having a second conductive pattern means thereon, said first and second conductive pattern means facing inwardly toward each other and being separated by said first cover film;

said first and second layers being bonded together to form a laminate;

said first and second pattern means respectively extending



outwardly of said first and second substrates and defining first and second extended circuit portions, one of said first or second extended circuit portion having a longer length than the other first or second extended circuit portion, said first and second extended circuit portions having terminal portions at each end thereof;

said elastomeric element having oppositely disposed first and second surfaces wherein said one of said first or second extended portion is wrapped about all of said first surface and a portion of said second surface; and

wherein the other of said first or second extended portion is wrapped along a portion of said second surface so that both said first and second terminal portions are electrically isolated from each other and are positioned on said second surface of said elastomeric element, said terminal portions being adapted to electrically contact another circuit device.

4,691,973

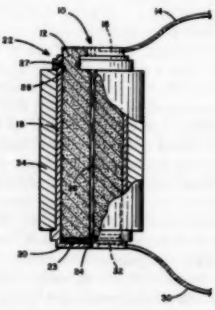
SUPERCONDUCTING CONNECTOR

Mark E. Rosheim, St. Paul, Minn., assignor to Sperry Corporation, Blue Bell, Pa.

Filed Jun. 5, 1986, Ser. No. 871,213

Int. Cl.[4] H01R *13/20*

U.S. Cl. 439—161 **6 Claims**



1. A superconducting connector comprising a cylindrical

male pin consisting of a superconducting material, a cylindrical mating female member consisting of superconducting material for receiving the male pin therein in sliding contact therewith, a cylindrical sleeve surrounding the outside of said cylindrical female member which consists of a material which has a higher thermal coefficient of expansion than said superconducting material wherein when said connecting assembly is cooled to superconducting temperature range said sleeve constricts said cylindrical female member so that said female member secures said male pin therein at a superconducting operating temperature range and when the temperature is elevated above said superconducting operating temperature range said male pin may be removed from said female member, first electrical conductor means connected to said male pin and second electrical conductor means connected to said female member, wherein said male pin is cylindrical and has a centrally located venting channel which extends throughout its entire length.

4,691,974

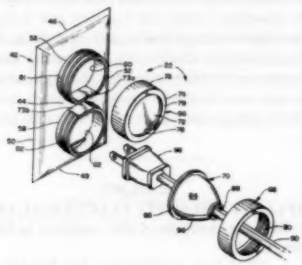
SAFETY COVERS FOR ELECTRIC OUTLETS

Michael B. Pinkerton, 2015 144th SE., Bellevue, Wash. 98007, and David Moskowitz, 1803 127th SE., Bellevue, Wash. 98005

Filed Mar. 17, 1986, Ser. No. 815,528

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—147 **4 Claims**



1. A protective cover for an electrical outlet having an exposed female connector, said cover including: a plate which is adapted to fit over and be attached to said outlet, there being an aperture through said plate which is than aligned with said female connector and thereby allows a male connector to be plugged into the female connector; an externally threaded, cylindrical boss protruding from said plate and surrounding said aperture; and means which is or comprises an internally threaded cap adapted to be threaded onto said boss to prevent access to said female connector through said aperture, the external threads on said boss and the internal threads on said cap forming press and twist means requiring both that pressure be exerted on said cap to move it toward said plate and that the cap be simultaneously rotated to engage said external and internal threads to allow said cap to be removed from said boss.

4,691,975

INTEGRATED CIRCUIT TESTER SOCKET

Masami Fukunaga, and Tomoyoshi Yamaguchi, both of Kawaguchi, Japan, assignors to Dai-Ichi Seiko Kabushiki Kaisha, Kawaguchi, Japan

Filed Oct. 21, 1986, Ser. No. 921,255

Claims priority, application Japan, Oct. 21, 1985, 60-235054

Int. Cl.[4] H01R *13/635*

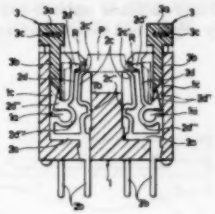
U.S. Cl. 439—266 **4 Claims**

1. An IC-tester socket, comprising:

a socket body capable of accomodating therein an IC package having a plurality of outwardly projecting lead terminals;

a plurality of contact pins provided within said socket body, each having a first and a second resilient arm capable of anchoring, at predetermined positions within said socket body, said IC package as said arms in their normal state nip each of said lead terminals; and

a releaser vertically movably mounted within said socket body and having a plurality of downwardly extending projections each engaging said second arm,



whereby when said releaser is depressed downwardly, said second arm is warped by said downwardly extending projections, thereby the nipping of said lead terminals by said first and second arms is released.

4,691,976

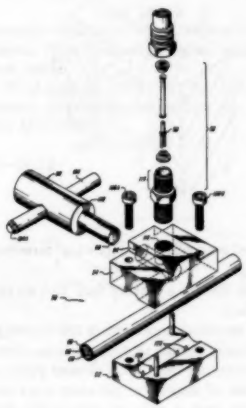
COAXIAL CABLE TAP CONNECTOR

Judith A. Cowen, Palo Alto, Calif., assignor to LRC Electronics, Inc., Horseheads, N.Y.

Filed Feb. 19, 1986, Ser. No. 831,007

Int. Cl.[4] H01R *4/02*

U.S. Cl. 439—394 **7 Claims**



1. A connector tap for a coaxial cable having a center conductor, a dielectric material surrounding said center conductor, and a shield concentric to said dielectric material, comprising:

a top piece partially surrounding said coaxial cable having a first aperture orthogonal to and offset from the axis of said coaxial cable and a second aperture having an axis normal to and intersecting the axis of said coaxial cable disposed orthogonal to said first aperture;

a bottom piece maintained integrally with said top piece and partially surrounding said coaxial cable;

means for forming a conductive path between said concentric shield and at least one of said top piece and said bottom piece; and

a center contact pin further including axially extending laterally-displaceable parallel pins passing through said second aperture to mechanically and electrically engage

said center conductor of the coaxial cable at two surfaces thereof,

wherein said bottom piece and said top piece are integrally maintained as selected portions of said concentric shield and said dielectric material are removed through said first aperture and said center contact pin is inserted through said second aperture to displace some of the unremoved portion of said dielectric material and mechanically and electrically engage said center conductor at two surfaces thereof.

4,691,977

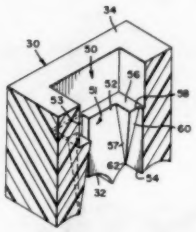
COVER FOR FLAT CABLE CONNECTOR

Joseph C. Marzili, Hershey, and Brian D. Stephenson, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 721,255, Apr. 8, 1985, abandoned. This application Jul. 14, 1986, Ser. No. 885,378

Int. Cl.[4] H01R *11/20*

U.S. Cl. 439—404 **4 Claims**



1. An electrical connector for electrical termination to a flat cable comprising:

housing means having a mating face and an opposed cable receiving face;

a plurality of terminals mounted in the housing means having substantially planar slotted portions extending above the cable receiving face, each slotted plate portion comprising a pair of insulation piercing arms defining a slot therebetween and a pair of outwardly directed barbs adjacent the free ends of respective arms;

cover means having a terminal receiving face, an opposed outer face, and passages therethrough aligned to accept the arms of respective slotted plate portions;

each passage having opposed internal sidewalls and opposed internal endwalls, each endwall having thereon a ledge on which a shoulder of a respective barb is seated to retain the cover when a cable is terminated thereto; and

ramp means provided in each passage, each ramp defining a bearing surface against which the respective arm of the slotted plate portion engages as the cover means is inserted into the housing means, directing the arm normally of the plane of the slotted plate portions during termination of the flat cable to the slotted plate portions of the terminals causing the slotted plate portions to transversely wipe respective conductors of the flat cable, ensuring a positive electrical connection therewith.

4,691,978

CIRCUIT BREAKER, IN PARTICULAR AN ACCESSORY OR MOTOR CONTACTOR

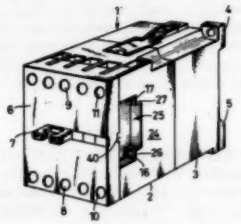
Helmut Lemmer, Marienheide-Kalsbach, Fed. Rep. of Germany, assignor to Square D Starkstrom GmbH, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,251

Claims priority, application European Pat. Off., Apr. 15, 1985, 85 10 4537.7

Int. Cl.[4] H01R *13/70*

U.S. Cl. 439—620 **17 Claims**



1. A circuit breaker comprising a housing, coil connector screws and associated connection rails carried by said housing, a module associated with said housing and being adapted to limit or attenuate voltage peaks, said module having electrical connector means for electrically connecting said module to said connection rails otherwise than through said coil connector screw, and said electrical connector means include a pair of metallic leaf springs each in contact with one of said connection rails.

4,691,979

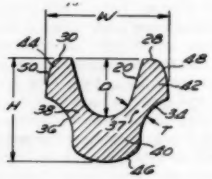
COMPLIANT PRESS-FIT ELECTRICAL CONTACT

Wayne E. Manska, Anaheim, Calif., assignor to Manda R & D, Anaheim, Calif.

Filed Aug. 4, 1983, Ser. No. 520,151

Int. Cl.[4] H01R *13/41*

U.S. Cl. 439—82 **25 Claims**

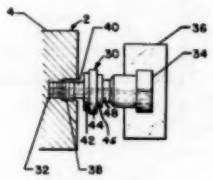


25. A compliant electrical contact comprising:

a compliant section, formed in said compliant electrical contact, said compliant section comprising a pair of arm portions and a base portion between said arm portions, and including a central longitudinal trough, each of said arm portions and said base portion including respective hole contact surfaces for engaging said hole during insertion of said contact into said hole such that said arm portions deflect inwardly towards each other, said arm portions including respective relief areas, the cross-sectional material thickness at said relief areas being (i) thinner than the cross-sectional thickness of the base portion and (ii) selected to weaken said arm portions at said relief areas to cause said arm portions preferentially bend at said relief areas more than at said base portion and the rest of the arm portions in response to interference of said contact with said hole, such that most of said bending of said arm portions occurs at said relief areas, thereby causing said

compliant section to readily comply to the dimensions of said hole and be retained in said hole by interference fit.

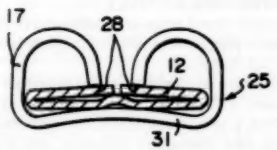
4,691,980
QUICK DISCONNECT BATTERY TERMINAL
Jules A. Sandor, 12012 Bambi Pl., Granada Hills, Calif. 91344
Filed Aug. 15, 1986, Ser. No. 896,728
Int. Cl.[4] H01R 11/26
U.S. Cl. 439—476 9 Claims



1. A battery terminal for a battery, cable combination comprising:

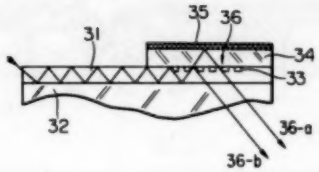
a bolt including a noncircular head portion with a first diameter and a body portion having a diameter less than said first diameter and having a longitudinal axis, and a handle molded onto said head portion and onto a part of said body portion so as to preclude movement of said handle along said longitudinal axis.

4,691,981
TAB-FORM TERMINAL
Daniel R. Coldren, Enola, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 842,962, Mar. 24, 1986. This application Feb. 27, 1987, Ser. No. 19,839
Int. Cl.[4] H01R 13/05
U.S. Cl. 439—816 6 Claims



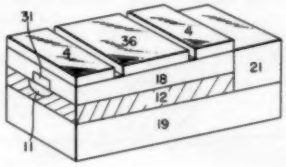
1. A tab-form terminal for mating with a receptacle of the type comprising a generally channel section body having a base and opposite side walls which have free ends rolled over to provide stiffly resilient arms which overlie the base, which terminal is stamped and formed from a single strip of sheet metal stock, having opposite marginal portions and a medial base portion, the opposite marginal portions having been folded towards each other to overlie and extend away from opposite edges of the medial base portion at a small angle thereto, bringing free ends of the marginal portions into spaced-apart adjacent relation, the marginal portions forming resilient flaps that are resiliently flexed towards the base portion during mating by engagement with the edges of the rolled-over ends of a receptacle.

4,691,982
OPTICAL COUPLER
Yukuo Nishimura, Sagamihara; Mamoru Miyawaki, Tokyo; Noriyuki Nose, Kawasaki, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 7, 1985, Ser. No. 709,300
Claims priority, application Japan, Mar. 10, 1984, 59-44829; Mar. 10, 1984, 59-44830; Mar. 10, 1984, 59-44831
Int. Cl.[4] G02B 6/10, 6/34
U.S. Cl. 350—96.12 10 Claims



1. An optical coupler which comprises an optical waveguide with a flat grating included therein, and a substrate on which the waveguide is formed, the optical waveguide being comprised of a film of an organic compound having both a hydrophobic moiety and a hydrophilic moiety, and the grating being comprised of a film having a different refractive index from that of the optical waveguide.

4,691,983
OPTICAL WAVEGUIDE AND METHOD FOR MAKING THE SAME
Toshio Kobayashi; Kazumasa Takagi, both of Tokyo, and Tokuumi Fukazawa, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 12, 1984, Ser. No. 660,144
Claims priority, application Japan, Oct. 14, 1983, 58-190739; Oct. 14, 1983, 58-190740
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.12 12 Claims



1. An optical waveguide comprising:

a substrate;

a garnet layer formed over said substrate, said garnet layer containing no iron and having a monocrystal region formed in a part thereof; and

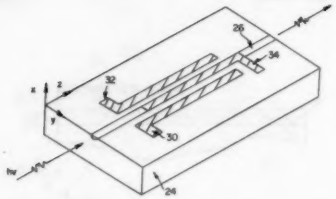
an iron garnet monocrystal layer provided on said monocrystal region.

4,691,984
WAVELENGTH-INDEPENDENT POLARIZATION CONVERTER
Suwat Thaniyavarn, Pasadena, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Sep. 26, 1985, Ser. No. 781,151
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.14 14 Claims

1. A wavelength-independent electrooptical polarization mode converter, comprising:

an electrooptical crystal substrate cut in a plane defined by a direction perpendicular to the optical axis of the crystal;

an optical waveguide formed by diffusion of material into a surface of the substrate, the waveguide being oriented to provide for the propagation of light from one end to the other, in a direction parallel with the optical axis of the substrate; and



electrode means disposed on the surface of the substrate and positioned with respect to the waveguide to provide control of a coupling coefficient for conversion between one polarization mode and another, and control of the relative phase between the two modes;

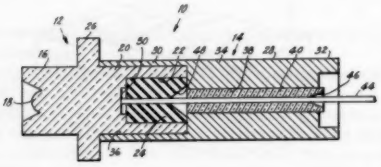
whereby both modes experience the same material refractive index, and any phase mismatch between the modes can be corrected by applying a suitable bias voltage through the electrode means.

4,691,985

FIBER OPTIC CONNECTOR

Jeffrey B. Shank; Steve E. Swanson, and Barry J. Opdahl, all of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 23, 1985, Ser. No. 779,018
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 **6 Claims**



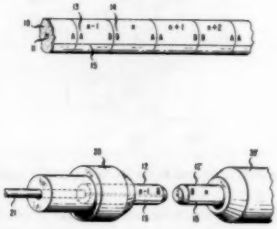
4. An optical fiber lens-connector assembly comprising: a lens body formed of transparent material, said lens body including a head end having a lens formed therein, a tail end of substantially cylindrical configuration having an axial cavity therein formed to receive an elastomeric fiber holder, and a shoulder formed intermediate said head end and said tail end and projecting radially outward from said lens body; and a connector for joining an optical fiber to said lens body, said connector comprising: a generally cylindrical body having a longitudinal axis, said body being formed of a metallic material having a low thermal expansion coefficient and having a first end, a second end, and an intermediate portion therebetween; said first end having a longitudinal cavity of a given diameter formed to fittingly receive said tail end of said lens body; said intermediate portion having a longitudinal cavity therein having a diameter less than said given diameter; and a borosilicate glass tube having a longitudinal aperture therethrough fitted into said longitudinal cavity in said intermediate portion.

4,691,986

ALIGNED PLUG OPTICAL FIBER CONNECTOR WITH "CONTIGUOUS" PLUGS, AND METHOD FOR USING SAME

James A. Aberson, Jr., Atlanta; George F. DeVeau, Jr., Stone Mountain; Terry D. Mathis, Lilburn, and Calvin M. Miller, Roswell, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 6, 1985, Ser. No. 795,483
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 **25 Claims**



1. Optical fiber connector comprising

(a) a first and a second tubular member, to be referred to as the first and the second plug, respectively, each plug having an outer cylinder surface, an axis, a bore that is substantially concentric with the outer cylinder surface, and an end face, an end portion of an optical fiber to be inserted into the bore of each of the plugs and to be maintained therein fixed relative to the plug;

(b) first means for maintaining the outer cylinder surface of the first plug essentially concentric with the outer cylinder surface of the second plug, with the first plug end face facing the second plug end face; and

(c) second means for maintaining the first plug in essentially fixed axial relationship with the second plug;

CHARACTERIZED IN THAT

(d) the first and second plugs are contiguous plugs, where by "contiguous plugs" we mean herein plugs fabricated by a process that comprises:

providing a length of tubular stock comprising a multiplicity of segments, a "segment" being a portion of the tubular stock which is to be transformed, by a process comprising separating two contiguous segments, into a plug, a first and a second contiguous segment to be transformed into the first and second contiguous plugs, respectively, the two surfaces that result when two contiguous segments are separated to be termed the "contiguous" faces of the resulting plugs; and further CHARACTERIZED IN THAT the connector comprises:

(e) a feature or features that permit idenfitication of the contiguous face of the first and of the second plug, respectively, with the first and second plugs to be oriented such that the contiguous faces are the end faces; and

(f) a feature or features that permit identification of that rotational relationship between the first and the second plug which corresponds to the rotational relationship that existed between the first and the second segment prior to their separation.

4,691,987

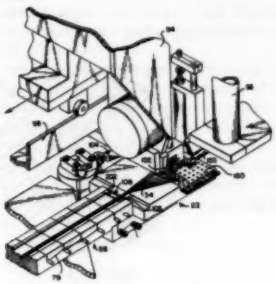
OPTICAL FIBER CABLE PRODUCER AND METHOD OF BONDING OPTICAL FIBERS TO LIGHT EMITTING DIODES

Peter R. Ebner, Hollis; Emanual C. Ebner, Jr., Hudson, both of N.H.; John H. Shaw, Manomet, Mass.; John G. Miller, Mont Vernon, and Donald E. Gorelick, Nashua, both of N.H., assignors to Itek Graphix Corp., Waltham, Mass.

Filed Jul. 8, 1983, Ser. No. 512,403

Int. Cl.[4] G02B *6/44;* **H01J** *5/16;* **B65H** *69/02*

U.S. Cl. 350—96.23 **12 Claims**



1. An automated fiber optic cable producer comprising:

a fiber filament feed mechanism;

an elongated fiber optic cable mold;

an LED emitter array fixed to said cable mold;

a fiber optic cable mold mounted for x/y movement relative to said fiber optic feed mechanism for locating an end of a fiber optic filament at an emitter in said emitter array and routing that filament along said mold;

a mapping means for determining the most intense area of illumination for each of said LED's of said array; and

a storage means for storing the precise location of the most intense area of illumination in an electronically readable memory.

10. A method for automated bonding of fiber optic filaments to LED's comprising the steps of:

placing one or more LED's upon a carrier of predetermined length and width;

mapping the most intense area of illumination for each of said LED's and storing the precise location of the most intense area of illumination in an electronically readable memory, said mapping step completed prior to starting any subsequent step;

electronically controlling relative movement between said carrier and a filament placement device to position said filament placement device and carrier one with respect to the other in accordance with said electronically stored precise locations; and

placing filaments onto individual LED's by means of said filament placement device.

4,691,988

PULLING EYE ASSEMBLY

Paul Tremblay, Pointe-aux Trembles, and Georges Tzabanakis, Montreal, both of Canada, assignors to Tekna Recherche & Developpment Inc., Canada

Filed Nov. 26, 1985, Ser. No. 802,046

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **12 Claims**

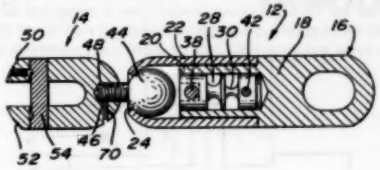
1. An articulatable pulling eye assembly for attachment to a terminal end of a communication optic fiber carrying cable which is subjected to tensional and rotational loads as said cable is pulled along trunking paths and the like by a pulling device, said assembly comprising:

an elongated body;

attachment means at one end of said body for attaching said assembly to said pulling device;

swivel means mounted at the opposite end of said body;

cable engaging means on said swivel means, an engaged cable being thereby freed from rotational loads transmitted by said pulling device through said body;



load bearing link means connecting said attachment means and said swivel means;

at least two independently rupturable tension responsive means in said link means for effecting separation of said cable from said pulling device when the tension exerted by said pulling device exceeds a predetermined value, said value being less than that required to damage optic fibers in said cable.

4,691,989

OPTICAL FIBER CABLE

Lee L. Blyler, Jr., Basking Ridge, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 528,529, Sep. 1, 1983, abandoned. This application Jun. 27, 1986, Ser. No. 880,959

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **11 Claims**

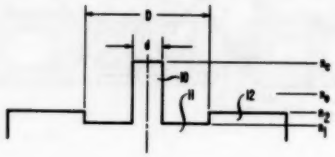
1. A cable containing (1) at least one coated optical fiber that for a distance of at least 10 meters lies other than along the neutral axis of said cable, (2) at least one member disposed in the axial direction of said cable and (3) an elastomeric composition in addition to said coated fiber that contacts and surrounds said coated fiber and said member characterized in that said elastomeric composition has an average elastic modulus greater than 300 psi and said elastomeric composition is capable of being removed without substantially affecting said coating of said fiber.

2. The cable of claim **1** wherein said elastomer satisfies at least one removal criterion and wherein said removal criteria are that (1) said elastomer is dissolvable in a non-reactive solvent, and (2) said elastomer melts at a temperature below 190 degrees C.

4,691,990
OPTICAL FIBER WITH DEPRESSED INDEX OUTER CLADDING

Leonard G. Cohen, Berkeley Heights; David W. Johnson, Jr., Pluckemin, and John B. MacChesney, Lebanon, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 13, 1984, Ser. No. 670,280
Int. Cl.[4] G02B *6/22*
U.S. Cl. 350—96.33 **12 Claims**



1. Multimode optical fiber comprising a core, at least a first cladding surrounding the core and being in intimate contact therewith, and a second cladding surrounding the first cladding, the core and the first cladding consisting essentially of glass produced in-situ by means of a glass-forming reaction, the second cladding being the outermost glass portion of the optical fiber and consisting essentially of glass derived from a preexisting tube comprising silica as a major constituent, the second cladding having an effective refractive index n_2,

characterized in that

the second cladding comprises at least one index-lowering dopant, and the effective refractive index n_2 is at least 0.001 less than the refractive index of essentially pure silica.

4,691,991
SINGLE MODE MODIFIED W-FIBER

Hans-Georg Unger, Brunswick, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,701
Claims priority, application European Pat. Off., Jun. 29, 1983, 83106312.8
Int. Cl.[4] G02B *6/22*
U.S. Cl. 350—96.33 **7 Claims**

5. A single-mode W-fiber consisting essentially of:

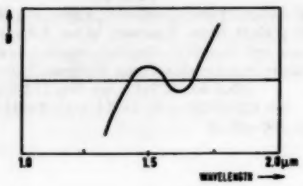
a cylindrical core;

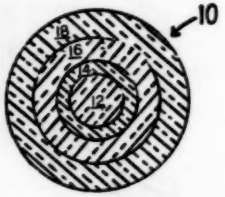
a cylindrical inner cladding layer surrounding the core;

an outer cladding layer surrounding the inner layer; and

means, cooperating with the core and the inner and outer cladding layers, for imparting to the fiber a wavelength dispersion coefficient that is zero at three different wavelengths, said means including a cylindrical threshold cladding layer disposed between the inner and outer cladding layers, the index of refraction of the threshold cladding layer being greater than the index of refraction of the outer cladding layer,

wherein the ratio of the outer diameter of the threshold cladding layer to the inner diameter thereof as well as the ratio of the inner diameter of the threshold cladding layer to the core diameter range from about 1.4 to about 1.8, and wherein the index of refraction of the threshold cladding layer ranges from about 0.05% to about 0.15% greater than the index of refraction of the outer cladding layer, while the index of refraction of the inner cladding ranges from 0.2% to 0.8% lower than the index of refraction of the outer cladding layer and the index of refraction of the



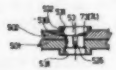


core ranges from 0.15% to 0.8% greater than the index of refraction of the outer cladding layer.

4,691,992
REFLECTOR FOR A SPOKED WHEEL

Weng-Pin Lin, and Nelson Chang, both of 30 Chien Yung Street, Tai Chung City, Taiwan

Filed Aug. 27, 1985, Ser. No. 770,161
Int. Cl.[4] G02B *5/12*
U.S. Cl. 350—99 **1 Claim**



1. A reflector for a spoked wheel, comprising:

a reflector plate having a first side, a second side and a wall forming a circular through hole extending from said first side to said second side, said wall forming a smaller diameter central portion between two large diameter outer remaining portions so that said wall defines a first annular shoulder between said central portion and one of said remaining portions near said first side, said first shoulder including inclined toothed surfaces, said wall also forming a second annular shoulder between said central portion and another of said remaining portions, said wall forming said central portion including an axial groove converging from said first annular shoulder to said second annular shoulder, said wall extending from said first side to form a first circular boss on said first side, said wall also extend-

ing from said second side to form a second circular boss on said second side, said second circular boss including two diametrically opposed notches at the edge thereof for receiving a spoke; and

a cylindrical locking body insertable into said through hole, comprising;

a headed end including axially inward projecting inclined toothed surfaces engageable with said toothed surfaces of said first annular shoulder of said reflector plate.

a forked end extending opposite said headed end forming two legs spaced to define a diametral access for a spoke, said legs including grooves in their inner portions to define retaining walls shaped to retain a spoke in a diameter position angled relative to said diametral access, in order to clamp said spoke against said notches of said reflector plate, and

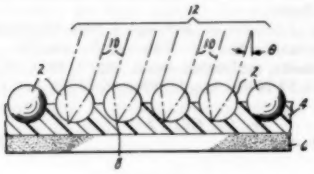
a protrusion extending from the periphery of said locking body near said forked end, said protrusion of a shape and size permitting it to move within said axial groove of said central portion when said locking body is inserted into said through hole, but causing said protrusion to be retained by said second shoulder when said locking body is rotated after being inserted into said through hole, so that said protrusion is not aligned with said groove.

4,691,993

TRANSPARENT SHEETS CONTAINING DIRECTIONAL IMAGES AND METHOD FOR FORMING THE SAME

Gerald R. Porter, Burnsville; Thomas I. Bradshaw, Afton, and Eric N. Hockert, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1985, Ser. No. 733,066
Int. Cl.⁴ G02B *5/128*
U.S. Cl. 350—105 **15 Claims**



10. A substantially transparent sheet comprising a monolayer of microlenses, there being a deformation in the rear portion of at least some of the microlenses, which deformations together are viewable as an image across a predetermined conical field in ordinary diffuse light conditions.

4,691,994

METHOD FOR A SOLAR CONCENTRATOR MANUFACTURING

Viktor V. Afian, ulitsa Sevaka, 2, kv. 13; Albert V. Vartanian, Aigestan-10, 2, kv. 57; Ruben G. Martirosian, ulitsa Shinararneri, 27, kv. 32, all of Erevan; Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64, Moscow; Dmitry S. Strebkov, Kirovogradsky proezd, 3, korpus 1, kv. 17, Moscow, and Eduard V. Tveryanovich, Malo-Kolkhoznaya ploschad, 1, kv. 90, Moscow, all of U.S.S.R.

Filed Oct. 6, 1981, Ser. No. 309,044
Int. Cl.⁴ G03H *3/00*
U.S. Cl. 350—320 **2 Claims**

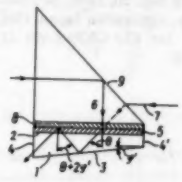
1. A method of manufacturing a solar concentrator employing a prism having a radiation input face, a reflection face and at least one radiation output face, said method comprising the steps of:

providing said prism with said reflection face angularly disposed with respect to said input face;

depositing a layer of light-sensitive material on said input face of the prism;

providing an auxiliary prism and a substance having a refractive index close to that of said light-sensitive material and placing said substance between said light-sensitive material and said auxiliary prism;

recording an interference pattern to obtain a three dimensional hologram in said light-sensitive layer by the use of a reference laser beam and an object laser beam by sending said reference laser beam to said light-sensitive layer via



said auxiliary prism and said substance in the direction of propagation of the incident radiation to be concentrated and by directing said object laser beam via said auxiliary prism at an angle with respect to said light-sensitive layer such that fringe planes are formed therein in order to diffract said incident radiation at said angle;

removing said auxiliary prism and said substance; and

developing said light-sensitive layer;

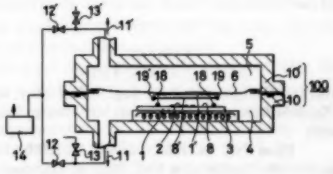
wherein the angular relationship between said reflection face, said input face and said angle are chosen to preclude the diffraction of a beam which has been reflected from said reflection face.

4,691,995

LIQUID CRYSTAL FILLING DEVICE

Shunpei Yamazaki, Tokyo; Toshimitsu Konuma, Atsugi; Toshiji Hamatani, Atsugi; Akira Mase, Atsugi; Kaoru Koyanagi, Saku; Shinji Imato, Atsugi; Toshiharu Yamaguchi, Zama; Mitsunori Sakama, Hiratsuka, and Takashi Inujima, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Jul. 15, 1986, Ser. No. 885,662
Claims priority, application Japan, Jul. 15, 1985, 60-155835; Jul. 15, 1985, 60-155836; Jul. 15, 1985, 60-155837
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—331 R **9 Claims**



1. A liquid crystal filling system comprising:

a vacuum chamber;

a flexible sheet provided in the chamber and separating the chamber into first and second spaces in an air tight manner; and

first and second evacuating devices for said first and second spaces.

5. A liquid crystal filling method comprising:

(1) a step of preparing first and second substrates;

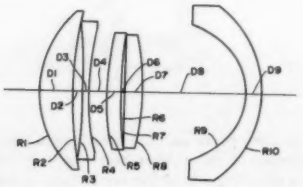
(2) a step of placing an amount of liquid crystal on the first substrate;
(3) a step of laying the second substrate on the first substrate coincident with each other;
(4) a step of applying pressure to the second substrate toward the first substrate; and
(5) a step of making a sealing structure on the periphery of the substrates.

4,691,996

WIDE-ANGLE PHOTOGRAPHIC LENS

Michio Cho, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 20, 1985, Ser. No. 778,070
Claims priority, application Japan, Oct. 9, 1984, 59-210577
Int. Cl.[4] G02B *9/60, 13/18*
U.S. Cl. 350—465 **9 Claims**



1. A wide-angle photographic lens system having a shortened overall length and consisting essentially of first lens means comprising a positive meniscus lens having a convex surface directed to the object, second lens means comprising a negative lens, third and fourth lens means comprising positive lenses, and fifth lens means consisting of a negative meniscus lens having a concave surface directed to the object, arranged in this order from the object side, said lens system satisfying the following conditions:

$$0.5<(f_A/f)<0.9 \quad \text{(i)}$$

$$-5<(R_5+R_6)/(R_5-R_6)<0 \quad \text{(ii)}$$

$$0<(R_7+R_8)/(R_7-R_8)<4 \quad \text{(iii)}$$

where f is the focal length of the overall lens system, f_A is the resultant focal length of the first to fourth lens means, R_5 is the radius of curvature of the object side surface of the third lens means, R_6 is the radius of curvature of the image side surface of the third lens means, R_7 is the radius of curvature of the object side surface of the fourth lens means, and R_8 is the radius of curvature of the image side surface of the fourth lens means;

said lens system being adapted to correct positive distortion, field curvature and lateral chromatic aberrations.

4,691,997

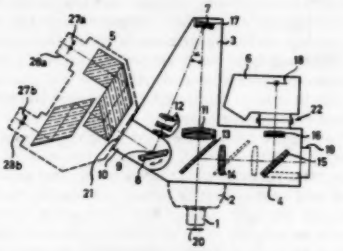
MICROSCOPE TUBE

Franz Muchel, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Feb. 24, 1986, Ser. No. 831,880
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508306
Int. Cl.[4] G02B *17/08, 21/00*
U.S. Cl. 350—503 **9 Claims**

1. A microscope tube comprising an optical system producing a first intermediate image of an object and a further image of said first intermediate image in a viewing plane of a viewing eyepiece, the image in said viewing plane of said eyepiece being an erect image of said object, right-way up and right-way round, said tube and its optical system including:

(a) means providing a linear and substantially vertical observation light path from a microscope objective to said first intermediate image;
(b) a concave reflecting mirror in the vicinity of said first intermediate image;
(c) means forming a light path exit port and eyepiece attachment place at a location below said first intermediate image;
(d) a flat mirror located in the vicinity of said exit port;



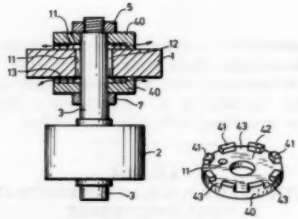
(e) said concave mirror serving to reflect said light path at an acute angle downwardly toward said flat mirror;
(f) said flat mirror serving to reflect said light path forwardly toward said exit port and toward an eyepiece mounted at said port; and
(g) an intermediate imaging optical system operatively located in said light path between said concave mirror and said flat mirror.

4,691,998

POLYGON MIRROR CONSTRUCTION

Yukuo Sakagaito, Yokohama; Katsutoshi Yonemochi, Zama; Koichi Kawata, Tama, and Takeshi Masaki, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 647,848, Sep. 6, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 841,020
Claims priority, application Japan, Sep. 9, 1983, 58-166968; Apr. 13, 1984, 59-74087; Apr. 13, 1984, 59-74088; Apr. 13, 1984, 59-74089
Int. Cl.[4] G02B *5/08, 5/10*
U.S. Cl. 350—616 **12 Claims**



12. A polygon mirror assembly comprising:
a polygon mirror of unitary construction having a central hole for a motor shaft;
a motor shaft extending through said hole;
an abutment on said shaft;
a nut threaded onto one end of said shaft spaced from and facing said abutment for receiving said mirror therebetween;
a pair of spacers respectively having a central hole for said motor shaft and at least one recess for flow of air therethrough, and at least one of said spacers having at least one through hole for flow of air from or to said recess, one

of said spacers being between said nut and said mirror and the other of said spacers being between said abutment and said mirror.

4,691,999

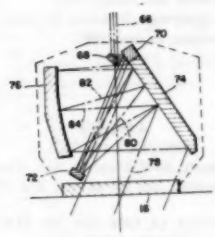
AFOCAL BEAM EXPANSION APPARATUS AND METHOD

Bryce A. Wheeler, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 4, 1986, Ser. No. 848,182

Int. Cl.[4] G02B *5/10, 17/06, 26/10*

U.S. Cl. 350—620 **12 Claims**



1. A compact expansion and pointing system, comprising:

a pointing reflector means oriented to receive an incident beam along a predetermined incident axis and to reflect and point the beam along a desired output axis,

expansion reflector means adapted to receive an input collimated beam, to apply an angular divergence to the input beam so that it's cross-section expands, and to direct the expanding beam onto the pointing reflector means along an axis other than said incident axis, and

a collimating reflector means positioned to receive the expanding beam reflected from the pointing reflector means and to reflect the beam back to the pointing reflector means along said predetermined incident axis, the collimating reflector means applying a collimation to the expanding beam so that it is reflected by the pointing reflector means along the desired output axis as a substantially collimated beam of greater cross-section than the input beam.

4,692,000

MOTOR-DRIVEN COLLAPSIBLE DOOR MIRROR

Yasuto Wada, Machida; Yoshihiko Ishiyama, Isehara, and Makoto Yamashita, Ayase, all of Japan, assignors to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 796,697

Claims priority, application Japan, Nov. 12, 1984, 59-236594; Jan. 14, 1985, 60-3097[U]; Jan. 29, 1985, 60-9998[U]; Aug. 26, 1985, 60-129833[U]; Aug. 26, 1985, 60-129834[U]; Aug. 26, 1985, 60-129835[U]

Int. Cl.[4] B60R *1/06;* G02B *7/18*

U.S. Cl. 350—637 **12 Claims**

1. A motor-driven collapsible door mirror comprising:

a base fixed to a door of a car;

a fixed shaft attached to the base;

a mirror housing supported, rotatable round the fixed shaft, to hold a mirror adjustable;

a drive motor housed, parallel to the fixed shaft, in the mirror housing;

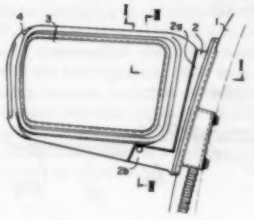
a speed reducer mechanism housed, serial to the drive motor and parallel to the fixed shaft, in the mirror housing;

a system for transmitting a power of the drive motor through the speed reducer mechanism to the mirror housing;

a means provided in the power transmission system for absorbing overload added thereto;

a fixed gear attached to the fixed shaft and included in the power transmission system;

a bracket provided on the mirror housing, and having a cylindrical portion through which the fixed shaft is inserted and a holder member for the speed reducer mecha-



nism is attached to the cylindrical portion of the bracket; and

a switch mechanism provided on a top portion of the fixed shaft for detecting a predetermined position of the mirror housing rotated.

4,692,001

RIMLESS SPECTACLES FOR CORRECTION PURPOSES

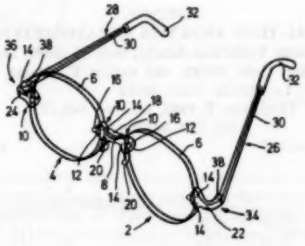
Wilhelm Anger, Via Brattas 4, CH-7500 St. Moritz, Switzerland

Filed Oct. 15, 1984, Ser. No. 660,739

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429090

Int. Cl.[4] G02C *1/02, 5/02*

U.S. Cl. 351—41 **7 Claims**



1. Rimless spectacles for correction purposes comprises a central portion and two side components,

a. said central portion including two lenses, a bridge, fastening devices for connecting the bridge with one each of the respective lenses, two side bridges or one saddle bridge, and bridge supports for connecting the bridge with the side bridges or the saddle bridge;

b. each side component including a hinge piece, a fastening device for connecting the hinge piece with one of the two lenses, a hinge bolt and a temple having a temple end piece which goes beyond the ear;

c. each hinge piece being engaged with the associated temple via at least one hinge eye and the hinge bolt penetrating it; and

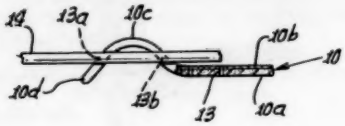
d. the bridge, the fastening devices, the two hinge pieces and the two temples being made substantially of synthetic plastic material selected from the group consisting of polyetherimide and polyethersulfone.

4,692,002

HEADBAND ATTACHABLE TO SPECTACLES FRAME STEMS

Robert W. Meistrell, Redondo Beach, Calif., assignor to Dive N'Surf, Hermosa Beach, Calif.

Filed Nov. 18, 1985, Ser. No. 799,175
Int. Cl.[4] G02C 3/00
U.S. Cl. 351—156 9 Claims



1. An eye-glass frame retainer comprising

(a) an elongated band that is lengthwise stretchable, the band of a length to extend about the back of the wearer's head,

(b) the band having substantially the same width throughout its length, including end portions thereof,

(d) each of said end portions containing a series of lengthwise spaced through perforations sized to stretchably pass an eyeglasses frame stem so as to grip the stem and retain the end portion thereon, when the band is stretched about the wearer's head, exerting endwise force on said band end portions,

(d) the band consisting of a layer of elastomeric foam which is lined on one side with a sheet of stretchable fabric, all said perforations extending through both said layer and sheet,

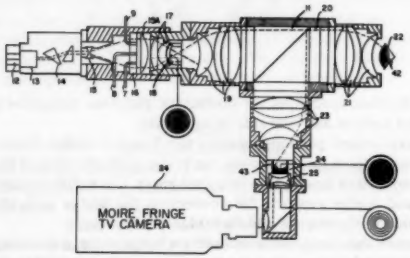
(e) and whereby when the frame having two stems is projected through perforations in said end portions, the perforations stretch open to pass and grip the stems.

4,692,003

REAL-TIME ANALYSIS KERATOMETER

Iwao P. Adachi; Yoshifumi Adachi, both of 15042 Temple St., Westminster, Calif. 92683, and Robert E. Frazer, 317 San Juan Way, La Canada, Calif. 91011

Filed Nov. 7, 1983, Ser. No. 549,137
Int. Cl.[4] A61B 3/10
U.S. Cl. 351—212 10 Claims



1. A method for real-time analysis of corneal curvature by measurement of aberration in a fiducial line image reflected from the corneal surface, comprising the steps of:

projecting a polarized electromagnetic radiated fiducial line image on said corneal surface, which reflects said projected image;

separating said reflected image from said projected image by shifting the plane of polarization of said reflected image with respect to said projected image to produce a polarization shifted reflected image having information of curvature of said corneal surface;

superimposing a replica of said projected polarized fiducial line image on said polarization shifted reflected image, concentric therewith, to produce a composite moire image, including fringes and background;

detecting the moire image including fringes created by said superimposing step, and filtering said moire fringes from said background;

digitizing said filtered moire image for computing;

computing the number, and distance between said moire fringes to indicate the transverse aberration of said polarization shifted reflected image from said replica of said projected fiducial line image; and

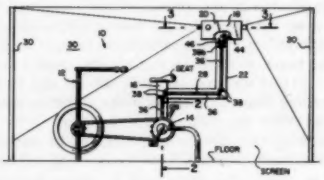
displaying the computed distances for interpretation of said corneal curvature, in real-time.

4,692,004

PROJECT-O-CYCLE

Delores A. Wainscott, 6446 Bamboo Ave., Cocoa, Fla. 32927, and George Spector, 233 Broadway, Rm 3815, New York, N.Y. 10007

Filed Oct. 14, 1986, Ser. No. 918,706
Int. Cl.[4] G03B 29/00
U.S. Cl. 352—132 4 Claims



1. A projector cycle which comprises:

(a) an exercise bicycle having a crankset and a seat tube;

(b) four projectors being mounted adjacent to and extending above said seat tube, each of said projectors having a film transport for moving a single frame of film in said projector; and

(c) a mechanical mechanism connecting said crankset to each of said film transports and capable of moving said film a frame at a time in coordination with rotation of said crankset so that each of said projectors will project motion pictures in a different direction from said exercise bicycle onto a screen.

4,692,005

DIGITAL DATA OUTPUT FROM A CAMERA

Satoshi Takami, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 904,574
Claims priority, application Japan, Sep. 6, 1985, 60-195757; Jun. 30, 1986, 61-151784
Int. Cl.[4] G03B 7/24, 17/18
U.S. Cl. 354—21 8 Claims

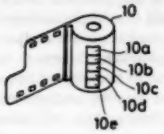
1. A camera, comprising:

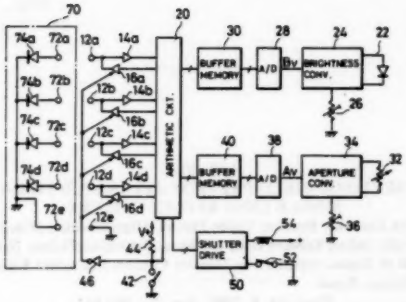
at least one electrical terminal for contacting at different times a film cartridge and a reading device;

switching means having a first state and a second state;

means for reading an exposure code from said film cartridge through said electrical terminal when said switching means is in said first state;

digital means responsive to said reading means for controlling photographic operations; and





means for impressing upon said electrical terminal a digital signal derived from said digital means when said switching means is in said second state.

4,692,006

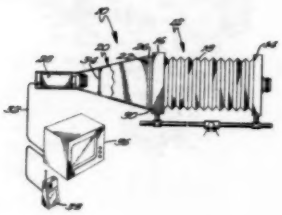
VIDEO VIEWFINDER SYSTEM

Mark Rice, and Douglas Meisner, both of Minneapolis, Minn., assignors to Interscan, Incorporated, Minneapolis, Minn.

Filed Feb. 28, 1986, Ser. No. 834,429

Int. Cl.[4] G03D *13/02, 17/04*

U.S. Cl. 354—75 **20 Claims**



1. Viewfinder system for use with a camera having a lens for forming an image of a photographic set to be photographically recorded on film, with the viewfinder system comprising, in combination: a viewfinder hood having a first end and a second end, with the viewfinder hood being attached to the camera adjacent to its first end; a ground glass located in the viewfinder hood adjacent its first end for forming a primary image by the camera lens; a video camera located in the viewfinder hood adjacent to its second end for aiming at the primary image formed on the ground glass by the camera lens; at least one video monitor for displaying a derived image of the primary image from the video camera, with the video camera and the video monitor being interconnected by means for transmitting signals between the video camera and the video monitor allowing a photographer to view the primary image formed by the camera lens on the video monitor at locations remote from the camera; a fresnel lens associated with the ground glass for concentrating the outgoing light rays from the ground glass to the video camera for providing more uniform brightness of the derived image from its center to its edges; and an anti-vignetting filter located intermediate the video camera and the ground glass, with the anti-vignetting filter having graduated density from highly dense at the center of the filter to clear at a radial distance away from the center for selectively absorbing the outgoing light rays from the ground glass to the video camera for providing more uniform brightness of the derived image from its center to its edges.

4,692,007

PHOTOGRAPHIC CAMERA

Philippe Vogt, Frohalpstrasse 65, CH-8038 Zurich, Switzerland

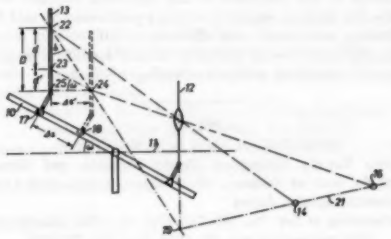
PCT No. PCT/CH85/00152, § 371 Date Aug. 8, 1986, § 102(e) Date Aug. 8, 1986, PCT Pub. No. WO86/02465, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 9, 1985, Ser. No. 894,672

Claims priority, application Switzerland, Oct. 10, 1984, 4859/84

Int. Cl.[4] G03B *19/10, 27/68*

U.S. Cl. 354—160 **7 Claims**



1. A professional camera having a rail which forms the base of the camera and can be inclined to the horizontal and having a lens standard and an image standard which are displaceable on said rail independently of each other and on which a lens support and an image holder respectively which are swingable around at least one axis which is directed transverse to the base of the camera are arranged, and having a ground glass which is adapted to be attached to the image holder and has at least two focusing lines which extend parallel to the axis of swing of said holder, characterized by the fact that the rail (**10**) which forms the base of the camera has, associated with it, an electronic measurement sensor (**37, 38**) for its angle of inclination (ω) and at least the image standard has associated with it an electronic measurement sensor (**42, 43**) for its displacement along the base of the camera, and furthermore there is also provided an electronic circuit (**30**) which, from the inputted measurement values for the distance (d) between the two image point (**22, 23**) on the ground glass measured perpendicular to the swivel axis, the angle of inclination (ω) of the base of the camera and the displacement (Δs) of the vertically standing image standard along the base of the camera, calculates the angle of swing (δ) of the image holder which is necessary for the simultaneously sharp focusing of the two image points on the ground glass.

4,692,008

DISPLAY DEVICE FOR CAMERA

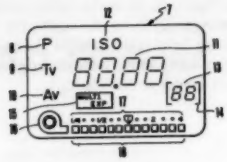
Kazuhiko Arakawa, Tokyo; Go Tokura, Kanagawa; Kazuo Fujibayashi, Kanagawa; Masayoshi Kiuchi, Kanagawa, and Yoshihito Harada, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jan. 29, 1986, Ser. No. 823,621

Claims priority, application Japan, Feb. 1, 1985, 60-16623

Int. Cl.[4] G03B *1/66, 17/18, 17/36*

U.S. Cl. 354—217 **6 Claims**



1. A display device for a camera comprising:

(a) a plurality of patterns adjacently disposed to each other;

(b) a drive circuit for detecting a film feeding operation by a film feeding mechanism and for having said plurality of patterns change their forms of display time-serially, one after another, during film feeding, said circuit having a first display mode for fixing a particular display pattern upon completion of the film feeding operation, and a second display mode for selecting and displaying one of said patterns corresponding to a set information in response to an operation of an exposure information setting operation member; and

(c) a control circuit for prohibiting a response by the drive circuit to the operation of said operation member when the film feeding operation is being performed by said film feeding mechanism, and allowing a shift to said second display mode by an operation of said operation member upon completion of the film feeding operation.

4,692,009

BRAKING DEVICE FOR SHUTTER

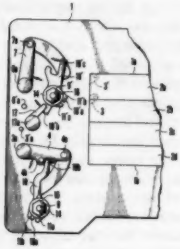
Yasuhiro Toyoda, Kanagawa; Fumio Shimada, and Katsumi Yoshida, both of Saitama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 659,724, Oct. 11, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 777,858

Claims priority, application Japan, Oct. 18, 1983, 58-161748[U]

Int. Cl.[4] G03B *9/40*

U.S. Cl. 354—246 **8 Claims**



1. A braking device for a focal plane shutter comprising:

(a) a shutter operating member arranged to move when a shutter curtain runs;

(b) a first brake member arranged upon engagement with said shutter operating member to be rotatable;

(c) a second brake member arranged upon engagement with said first brake member to be rotatable; and

(d) a frictional member and a spring member for giving a frictional force to said first and said second brake members, whereby said first brake member engages with said shutter operating member in the early stage of braking and then turns in engagement therewith to give a relatively weak braking force to said shutter operating member, and said second brake member engages with said first brake member in the closing stage of braking and then turns along therewith to give a strong braking force to said shutter operating member.

4,692,010

DEPTH-OF-FIELD PREVIEW APPARATUS FOR A SINGLE LENS REFLEX CAMERA

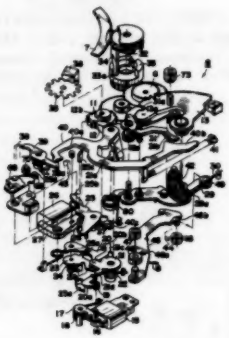
Akira Kataoka, Sennan; Yasuo Hawai, Higashiosaka; Hidehiko Fujii, Sakai; Tetsuro Oya, Osaka, and Akihiko Fujino, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 9, 1986, Ser. No. 883,641

Claims priority, application Japan, Jul. 10, 1985, 60-152854

Int. Cl.[4] G03B *9/02*

U.S. Cl. 354—273 **3 Claims**



1. In a single lens reflex camera including an objective lens system, a diaphragm in said objective lens system and a diaphragm stop-down mechanism for stopping-down said diaphragm, a depth-of-field preview apparatus comprising:

an operating member mounted in said camera to be manually moved between an operated position and a non-operated position, and urged in a direction from said operated to said non-operated positions;

a first switch adapted to be changed over from a first condition to a second condition in response to the movement of said operating member to said operated position and from said second condition to said first condition in response to the movement of said operating member to said non-operated position;

means for actuating said diaphragm stop-down mechanism in repsonse to said change-over of said first switch from said first to said second condition;

means for stopping said diaphragm stop-down mechanism to set said diaphragm to a reduced aperture size;

a second switch adapted to be changed over from a first condition to a second condition with said diaphragm stop-down mechanism stopped by said stopping means;

a control circuit for producing a preview display signal with at least one of said first and second switches being in said second position; and

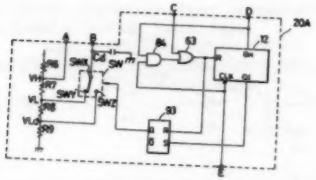
a display means for displaying that the camera is in the preview condition, in response to said preview display signal.

4,692,011
Patent Not Issued For This Number

4,692,012
AUTOMATIC FOCUS ADJUSTMENT APPARATUS

Touru Tano, Kakogawa; Akihiro Fujita, Mie, and Takayuki Utsumi, Gifu, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

Filed Mar. 24, 1986, Ser. No. 843,180
Claims priority, application Japan, Mar. 27, 1985, 60-60994
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 **7 Claims**



1. An automatic focus adjustment apparatus for use with a photographic or video camera comprising:

a light emitting element for radiating light to a subject to be photographed;

a pair of photo-detector means;

an optical system for directing into said pair of photo-detector means a reflected light portion of the light radiated from said light emitting element to said subject to be photographed;

an imaging optical system for imaging said subject;

a first integrator connected to one of said pair of photo-detector means for integrating an amount of light received by said one photo-detector means and for producing a first integral signal corresponding thereto;

a second integrator connected to the other of said pair of photo-detector means for integrating an amount of light received by said other photo-detector means and for producing a second integral signal corresponding thereto;

comparator means having first and second reference levels with which said first and second integral signals are compared, said first reference level being higher than said second reference level;

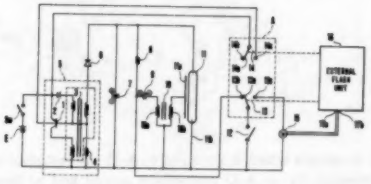
an automatic focusing means for shifting said imaging optical system along its optical axis when said first integral signal has reached said first high reference level before said second integral signal has reached said second low reference level, so that each of said pair of photo-detector means receives a substantially equal amount of light reflected from said subject to be photographed; and

counting means for producing a time signal when a predetermined time has elapsed, and means for lowering said second low reference level to enlarge an in-focus range when neither of said first and second integral signals reaches said first high reference level until said counting means produces said time signal.

4,692,013
CAMERA INCORPORATING FLASH UNIT

Tadashi Okino, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 536,352, Sep. 27, 1983, abandoned. This application May 22, 1985, Ser. No. 736,977
Claims priority, application Japan, Sep. 29, 1982, 57-170629
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—413 **16 Claims**



1. A flash unit incorporated in a camera permitting a detachable flash unit to be mounted thereon, comprising:

(A) electric load means for the camera; and

(B) an internal flash unit including:

(a) light generating means for emitting light to illuminate an object in response to a trigger signal;

(b) trigger signal producing means connected between the light generating means and a synchronous switching means for generating the trigger signal upon actuation of the synchronous switching means;

(c) an external synchronizing terminal connected to a trigger circuit of the detachable flash unit for transmitting a synchronous signal which is produced upon actuation of the synchronous switching means;

(d) supply means for applying electric energy from a source to the internal flash unit and the electric load means; and

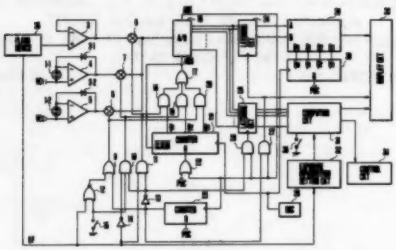
(e) control means responsive to outputs of a distance measuring device for allowing transmission of the synchronous signal to the trigger circuit of the detachable flash unit and rendering said internal flash unit inoperative when the distance measuring device produces a signal indicating a long distance.

4,692,014

DISPLAY DEVICE FOR CAMERA

Masayoshi Kiuchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 659,719, Oct. 11, 1984, abandoned.
This application Feb. 10, 1986, Ser. No. 828,577
Claims priority, application Japan, Oct. 14, 1983, 58-193133
Int. Cl.[4] G03B *17/18*
U.S. Cl. 354—471 **13 Claims**



1. A camera which is arranged to A-D convert photographic information by an A-D conversion circuit and to display the information by display means on the basis of a digital value obtained through an A-D converting operation of said A-D conversion circuit, comprising:

(a) an input circuit arranged to supply to said A-D conversion circuit, in place of said photographic information, a brightness modulating datum required for determining a display brightness of display information to be displayed by said display means, said circuit supplying alternatively said photographic information and said modulating datum, with a predetermined timing, to said A-D conversion circuit; and

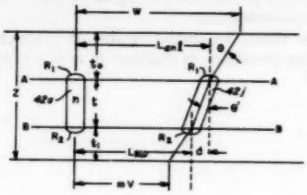
(b) an adjustment circuit which adjusts said display brightness of display information displayed by said display means on the basis of said A-D converted modulating datum.

4,692,015

SHORT FOCAL LENS ARRAY WITH MULTI-MAGNIFICATION PROPERTIES

Robert P. Loce, Webster; James D. Rees, Pittsford, and John A. Durbin, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1986, Ser. No. 839,667
Int. Cl.[4] G03B *27/00*
U.S. Cl. 355—1 **10 Claims**



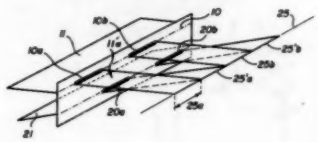
1. A short focal length lens array comprising a homogenous photosensitive glass body having formed therethrough a plurality of lenslets, at least one face of each lenslet having a spherical surface extending above the glass body surface, the lens array characterized by the center axes of said lenslets being tilted with respect to each other from the center of the array out to the array edges and by the array having a two-dimensional, full frame configuration.

4,692,016

PROCESS FOR ELECTROPHOTOGRAPHIC MATRIX PRINTING AND DEVICE FOR CARRYING OUT THE PROCESS

Pierre Genequand, Geneva, Switzerland, assignor to Fondation Suisse pour la Recherche en Microtechnique, Neuchatel, Switzerland

Filed Mar. 14, 1986, Ser. No. 839,911
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—1 **10 Claims**

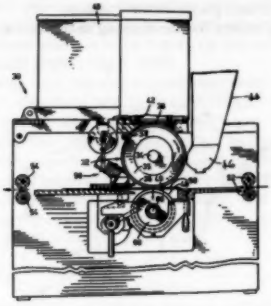


1. Process for electrophotographic matrix printing, wherein a light beam is projected onto an array of electrooptical modulators disposed along line segments, wherein this beam is recombined, after passage through said modulators, in one continuous line on a photosensitive support in motion, wherein the modulator line segments are placed alternately along two parallel lines, the incident light beam is divided into two convergent light sheets, each of which is projected onto one line of segments, and wherein the spacing of the segments and the direction of the light rays of each sheet are defined in such a manner that the succession of rays derived from each modulator, when going over the successive segments alternately from one line to the other, forms, on the line of convergence, of the two sheets, a continuous succession of images of the modulators of the array.

4,692,017
TONER TRANSFER APPARATUS

Andrzej Maczuszenko, Etobicoke; Sotos M. Theodoulou, Bramalea, both of Canada, and John Rumsey, Charlestown, Mass., assignors to Delphax Systems, Mississauga, Canada

Filed Dec. 23, 1985, Ser. No. 812,027
Claims priority, application Canada, Dec. 24, 1984, 470985
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD 10 Claims



1. Apparatus for use with a magnetic toner transfer system, the toner mix including a particulate non-magnetic flow enhancer and the system comprising:

a hopper having a bottom opening;

a screen placed across the opening to support toner in the hopper with the toner bridging the openings in the screen;

an element in contact with an upper surface of the screen;

means operable to drive the element across the upper surface of the screen whereby said toner bridging is disrupted and toner falls through the screen into the toner system until bridging again occurs;

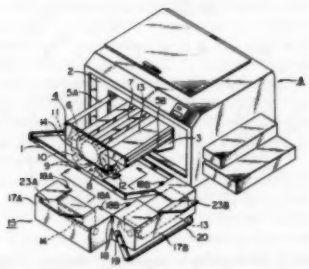
magnetized means located below the screen for attracting and collecting toner for transfer; and

a scavenger for coupling to the toner system to apply a small negative pressure to the system whereby air is caused to flow through the falling toner mix and into the scavenger thereby carrying with it the unattracted flow enhancer.

4,692,018
CARTRIDGE-TYPE APPARATUS FOR EXCHANGING A DEVELOPING DEVICE AND TONER SUPPLY CONTAINER

Takashi Tamura, Higashimine, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 772,251
Claims priority, application Japan, Sep. 10, 1984, 59-189061
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—3 R 11 Claims



1. A cartridge-type parts exchange assembly for an image recording device, said cartridge-type parts exchange assembly removably containing at least a developing device and a toner supply container but not an image holding member, said developing device and said toner supply container being adapted to be removably installed in said image recording device,

said parts exchange assembly comprising:

a cartridge housing including a pair of hollow vessels, said vessels each having an open end, one of said vessels removably containing said developing device and the other of said vessels removably containing said toner supply container;

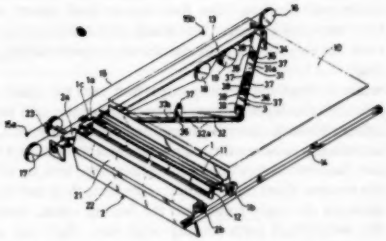
hinge means pivotally connecting said vessels together so that said vessels are rotatable about said hinge means between a closed position whereat said open ends of said vessels face each other, and an open position whereat said open ends are accessible and do not face each other; and

an openable lid provided on each of said vessels for selectively covering respective access openings of said vessels to permit access to the interior of said vessels when said lids are opened to permit a user to slide a respective developing device and a toner supply container out of a respective open end of its associated vessel when said vessels are in said open position, thereby facilitating installation of said developing device and said toner supply container in said image recording device.

4,692,019
DOCUMENT SIZE DETECTING DEVICE

Kiyoshi Morimoto, Osaka; Masuo Kawamoto, Daito; Hiroshi Kobayashi, Kobe; Masahiro Hashizume, Yao; Hideaki Tsudaka, Neyagawa, and Hiroshi Kimura, Habikino, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 1, 1986, Ser. No. 880,859
Claims priority, application Japan, Jul. 5, 1985, 60-148780
Int. Cl.[4] G03G *15/04*; G03B *27/62*
U.S. Cl. 355—8 3 Claims



1. A document size detecting device adapted to be mounted on an image forming device which exposes a document for forming an image thereon by moving an optical section, said document size detecting device comprising

an arm foldable at a predetermined portion thereof, and connected at one end thereof to a body of the image forming device at a predetermined position thereon and at the other end thereof to a movable frame at a predetermined position thereof which supports the optical section, so that the arm can be folded and unfolded in operative association with the movement of the optical section, and

a plurality of optical sensors attached to said arm corresponding to various format sizes of documents.

4,692,020

SHEET REVERSING IN COPYING MACHINE AND OTHER SHEET-HANDLING MACHINES

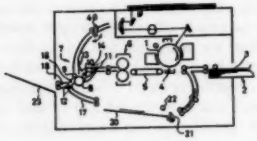
Sotohiro Tsujihara, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

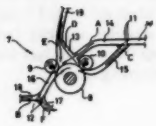
Filed Nov. 18, 1985, Ser. No. 799,265

Claims priority, application Japan, Nov. 17, 1984, 59-174684[U]

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—14 SH **11 Claims**





1. Apparatus comprising:

a main sheet inlet for receiving sheets leading edge first, which branches into a normal sheet inlet and a reverse sheet inlet, an inlet switch which is located at the branching point and has a normal position for directing the sheets leading edge first into the normal sheet inlet and a reversing position for directing the sheets leading edge first into the reverse sheet inlet, a switchback path, and an outlet path;

a main roller rotating in a selected direction;

a feed-in roller which is in rotational contact with the main roller adjacent the reverse sheet inlet to feed sheets therefrom into the switchback path leading edge first; and

a feed-out roller which is in rotational contact with the main roller adjacent the normal sheet inlet and the switchback path, to feed sheets from the normal sheet inlet into the outlet path leading edge first and to feed sheets which have been fed into the switchback path leading edge first, from the switchback path into the outlet path trailing edge first;

wherein a sheet fed leading edge first into the main sheet inlet travels, depending on the position of the inlet switch, either (i) into the normal sheet inlet leading edge first, then into the nip between the main roller and the feed-out roller and then into the outlet path leading edge first, or (ii) into the reverse sheet inlet leading edge first, then into the nip between the main roller and the feed-in roller, then into the switchback path leading edge first, then out of the switchback path trailing edge first and into the nip between the main roller and the feed-out roller trailing edge first and then into the outlet path trailing edge first.

4,692,021

IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 16, 1985, Ser. No. 788,209

Claims priority, application Japan, Oct. 19, 1984, 59-219923

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **18 Claims**

1. An image forming apparatus for forming a magnified/reduced image from an original onto a sheet in accordance with a selected magnification/reduction factor, comprising:

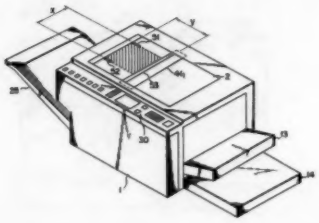
photosensitive means for holding an electric charge on a surface thereof;

charging means for uniformly applying said electric charge to said surface of the photosensitive means;

original table means for carrying an original thereon;

image exposure means for exposing said surface of said photosensitive means with a light beam corresponding to an image of said original, thereby forming an electric charge pattern corresponding to the original image on said surface of said photosensitive means;

developing means for developing said electric charge pattern;



magnification/reduction setting means for setting said magnification/reduction factor;

display means and optical scanning means for displaying an inner-reproducible range corresponding to said magnification/reduction factor and the size of the sheet on which said image is formed;

pulse motor means for moving said optical scanning means;

interlocking means for interlockingly moving said display means with a movement of said optical scanning means; and

control means for controllably driving said interlocking means in accordance with the image-reproducible range.

4,692,022

AUTOMATIC DUPLEX COPYING MACHINE AND METHOD OF TREATING PAPER JAMMING THEREFOR

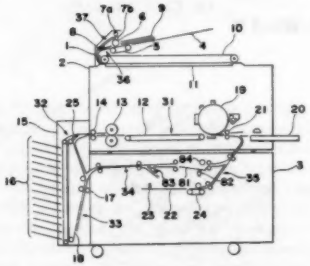
Shiyougo Iwai, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 1, 1986, Ser. No. 846,957

Claims priority, application Japan, Apr. 17, 1985, 60-82045; May 17, 1985, 60-106255

Int. Cl.⁴ G03B *27/32, 27/52*

U.S. Cl. 355—24 **3 Claims**



1. A method of treating a paper jam during a reverse-side copying operation for one-side copied paper sheets in a double-side copying process of an automatic duplex copying machine, wherein a copying operation is carried out on each of the originals having an odd page number during a first circulation

of a plurality of one-sided originals placed on an original tray of a circulatory document feeder, and wherein each of the originals having an even page number is copied on the reverse side of each one-side copied paper sheet during a second circulation of said originals, with each of said one-side copied paper sheets being temporarily stored in an intermediate tray, said method comprising the steps of:

(a) carrying out a copying operation for an insufficient number of copied paper sheets by supplying copy paper sheets from a paper supplying portion with respect to the original having an even page number placed on an original platform which is to be copied on the reverse side of said one-side copied paper sheet;

(b) storing each one-side copied paper sheet according to the above described step in an intermediate sub-tray;

(c) supplying said one-side copied paper sheet from said intermediate sub-tray with respect to the original having an odd page number which is subsequently transported from said original tray for reverse-side copying operation on said one-side copied paper sheet; and

(d) carrying out a copying operation on the reverse side of said one-side copied paper sheet.

4,692,023

OPTICAL ADAPTER FOR A LIGHT-WAVE RANGEFINDER

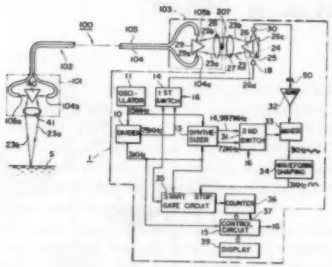
Fumio Ohtomo; Nobuo Hori; Yoshio Horikawa; Kazuaki Kimura, and Hiroo Sugai, all of Tokyo, Japan, assignors to Tokyo Kagaku Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 634,547, Jul. 26, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 816,581

Claims priority, application Japan, Jul. 30, 1983, 58-138742; Jan. 9, 1985, 60-1879; Jan. 9, 1985, 60-1881; Jan. 19, 1985, 60-1322

Int. Cl.[4] G01F *23/00*; G01B *11/14*

U.S. Cl. 356—5 **28 Claims**



1. Liquid level measuring apparatus, comprising:

first light generation means for generating a distance measuring light modulation by a given modulation signal;

second light generation means for generating a reference light which is modulated by said given modulation signal, said reference light having a wavelength different from the wavelength of said distance measuring light;

photoconduction means for optically conducting said distance measuring light and said reference light;

objective optical means including

objective lens means for projecting at least said distance measuring light onto a liquid surface to be measured and for condensing at least a reflected distance measuring light reflected from the liquid surface, and

light selection means for leading said distance measuring light exited from said photoconduction means toward the liquid surface and said reflected distance measuring light toward said photoconduction means respectively, and for returning said reference light exited from said photoconduction means toward said photoconduction means;

light receiving means for receiving both said reflected distance measuring light and said reference light returned through said photoconduction means; and

distance measuring means for determining a liquid level of the liquid surface based on a time delay between said distance measuring light and said reflected distance measuring light.

4,692,024

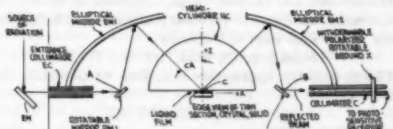
AUTOMATIC REFRACTOMETER

F. Donald Bloss, Blacksburg, Va., assignor to Electro-tec Corporation, Blacksburg, Va.

Filed May 10, 1985, Ser. No. 732,689

Int. Cl.[4] G01N *21/41*

U.S. Cl. 356—135 **42 Claims**



1. An optical refractometer capable of being adapted for automatically determining the principal indices of a specimen, comprising:

a means for receiving an incident radiation beam;

a first elliptical mirror having first and second foci;

a first rotatable surface for reflecting said incident radiation beam onto a reflecting surface of said first elliptical mirror and having an axis of rotation extending through said first focus of said first elliptical mirror;

a hemicylinder having a center of curvature at said second focus of said first elliptical mirror and including means for rotatably mounting and translating a specimen respectively about a first axis and along a second and third axes such that a portion of said specimen is located at said second focus to receive the reflected incident beam from said first rotatable surface;

a second elliptical mirror having third and fourth foci; and a second rotatable surface for reflecting the incident radiation beam from said second elliptical mirror and having an axis of rotation extending through said fourth focus, said third focus being at said first axis coincident with said second focus for producing a reflected beam output.

4,692,025

SEMICONDUCTOR COLOR SENSOR DETECTION CIRCUIT

Zempei Tani, Tondabayashi; Yoshifumi Masuda, Tenri, and Toshihide Miyake, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1985, Ser. No. 734,341

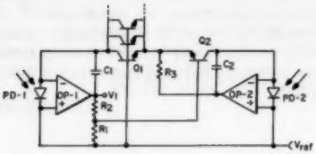
Claims priority, application Japan, May 30, 1984, 59-112744; Nov. 8, 1984, 59-236256

Int. Cl.[4] G01J *5/60*

U.S. Cl. 356—45 **8 Claims**

1. A semiconductor color sensor circuit comprising two photodiodes having mutually different wavelength sensitivity characteristics and two types of transistors for logarithmic

compression of signals from said photodiodes, said two type of transistors being so adjusted that the current densities there-



through are nearly equal to each other at a certain color temperature between 2000° K. and 8000° K.

4,692,026

PROCESS AND APPARATUS FOR CONTINUOUS DETERMINATION OF THE STATES OF ANISOTROPY OF OPTICALLY ACTIVE MATERIALS

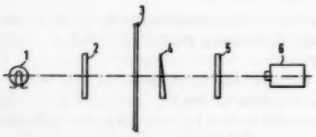
Wolfgang Gawrisch, Gau-Bischofsheim; Walter Valentin, Hohenstein, and Helmut Czepl, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,979

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435059

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—345 **10 Claims**



1. An apparatus for the continuous determination of the state of anisotropy of an optionally active material comprising:

(i) a light source;

(ii) a polarizer;

(iii) a compensating wedge;

(iv) an analyzer;

(v) means for photosensitive scanning of said analyzer wherein the optically visible transmission from said analyzer is scanned as a function of its point-wise brightness; and

(vi) a computer having a discriminator circuit; in combination such that light from said light source passes sequentially through said polarizer, said compensating wedge, and said analyzer before striking said means for photosensitive scanning of said analyzer, wherein said light is converted into electrical signals which are subsequently screened by said discriminator circuit so that higher than zeroth order interference stripes are not transmitted by said discriminator circuit and only the zeroth order interference stripe is operated on by said computer.

4,692,027

SPATIAL PROCESSING FOR SINGLE OR DUAL SHEAR WAVEFRONT SENSOR

Alan J. MacGovern, Acton, and Richard A. Hutchin, Marlboro, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jul. 3, 1985, Ser. No. 751,635

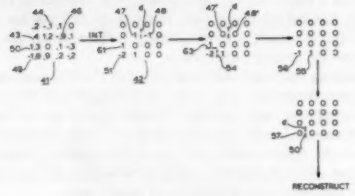
Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—353 **5 Claims**

1. A method of measuring the shape of a wavefront at an aperture divided into a plurality of subapertures with a wavefront sensor having a limited dynamic range, comprising the steps of:

a. utilizing said wavefront sensor to produce a map interferogram of said wavefront phase differences;

b. producing a matrix of loops of wavefront phase difference measurements derived from said wavefront sensor having values indicative of wavefront slopes, each loop corresponding to a subaperature portion of said wavefront;



c. summing said difference measurements in a particular direction around each of said loops in a closed path to provide closed loop positive or negative sums;

d. setting each closed loop sum of said sums to a modified sum equal to the nearest positive or negative integer or zero to provide a plurality of modified sums of positive or negative integers; and

e. utilizing each modified sum produced by step d to measure the slopes of said wavefront.

4,692,028

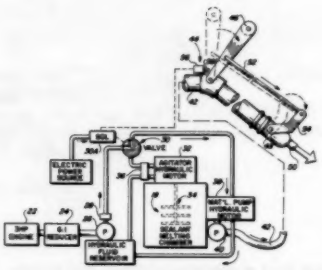
SEALANT MELTER/APPLICATOR WITH AUTOMATIC LOAD SWITCHING SYSTEM

Floyd D. Schave, Mesa, Ariz., assignor to Crafco, Inc., Phoenix, Ariz.

Filed Aug. 19, 1986, Ser. No. 897,870

Int. Cl.[4] B28C *1/22*

U.S. Cl. 366—22 **12 Claims**



1. A load switching system for a sealant melter/applicator comprising:

a. a sealant melting chamber;

b. an internal combustion engine for rotating a power output shaft;

c. an hydraulic pump for converting the rotary motion of said power output shaft into a flow of pressurized hydraulic fluid;

d. a first hydraulic motor having an output shaft for driving a sealant agitator positioned within said sealant melting chamber;

e. a second hydraulic motor for driving a sealant pump to transfer sealant from said sealant melting chamber through an applicator hose to a sealant discharge nozzle;

f. a sealant flow control valve coupled in series with said hose for regulating the flow of sealant through said sealant

discharge nozzle, said valve including open and closed positions;

g. means for sensing the position of said sealant flow control valve; and

h. flow diverter means coupled to said position sensing means and to said hydraulic pump for directing the flow of pressurized hydraulic fluid from said hydraulic pump to said first hydraulic motor when said sealant flow control valve is in the closed position and for directing the flow of pressurized hydraulic fluid from said hydraulic pump to said second hydraulic motor when said sealant flow control valve is in the open position;

whereby the load on said engine is maintained substantially constant as sealant is intermittently discharged through said sealant flow control valve.

4,692,029

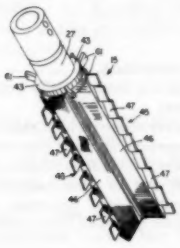
COMESTIBLE BEATER

William L. Davis, 880 E. 1st S., Salt Lake City, Utah 84102

Filed Apr. 1, 1985, Ser. No. 718,560

Int. Cl.[4] A23G *9/00*; B01F *7/00*

U.S. Cl. 366—149 **6 Claims**



1. In apparatus for preparing a beaten product including a chamber into which the ingredients of said product are introduced, said chamber having a generally vertical axis and a cylindrical side wall, said apparatus further including a beater assembly rotatively mounted within said chamber and a motor for imparting rotational movement to said beater assembly, an improved beater assembly comprising

an elongate rotor body disposed in said chamber to rotate about the generally vertical axis of said chamber, said rotor body having a longitudinal surface formed by at least three, elongate, rectangular, flat faces which are equally spaced around the circumference of said rotor body and which face radially outwardly from said vertical axis of said chamber,

a plurality of blades with at least one blade projecting outwardly from each of the respective flat faces of said rotor body toward the cylindrical side wall of said chamber, with each of said blades being formed integrally with said rotor body and inclined at an acute angle from the vertical when the rotor body is disposed in said chamber, whereby said blades beat the product and advance the product downwardly as said rotor body rotates with said chamber, and

distributor means are provided adjacent to the uppermost blades of said beater assembly when the beater assembly is positioned within said chamber, said distributor means comprising

a dish-shaped flange extending from the rotor body, and

a plurality of arcuately-shaped projections attached to the upper dished surface of said flange.

4,692,030

STATIC MIXING DEVICE FOR VISCOUS MELTS

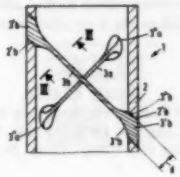
Willy Tauscher, Winterthur, and Gottlieb Schneider, Seuzach, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 1, 1985, Ser. No. 707,230

Claims priority, application Switzerland, Mar. 5, 1984, 1070/84

Int. Cl.[4] B01F *5/06*; B29B *1/06*

U.S. Cl. 366—337 **13 Claims**



1. A static mixing device for a viscous material comprising

a tubular casing having a wall disposed along a longitudinal axis to define a flow path for the viscous material; and

at least one mixing element disposed in and across said casing in said flow path, said mixing element including at least two webs disposed in crossing relation to each other and at an inclination to said longitudinal axis, each said web having a pair of terminal ends secured within said casing wall, said webs being transversely spaced from each other to define a space therebetween for passage of viscous material therethrough without hindrance.

4,692,031

MOON PHASE DISPLAY CLOCK

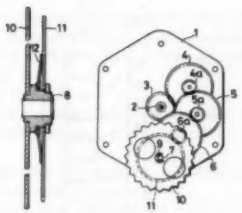
Koichi Kaneko, and Masado Hanya, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,990

Claims priority, application Japan, Jun. 20, 1985, 60-93786[U]

Int. Cl.[4] G04B *19/26*

U.S. Cl. 368—18 **8 Claims**



1. A clock for indicating the moon phase comprising: a base; an axle projecting from the base; a hub rotatably supported on the axle; a moon phase dial fixed to the hub for indicating the moon phase according to the angular position thereof relative to the axle, the moon phase dial having a set of circumferentially spaced projections around the periphery thereof which are manually engageable to effect correction of the angular position of the moon phase dial; a moon phase gear slideably disposed around the hub in spaced relation from the moon phase dial and being driven to continuously rotate around the axle at a period of rotation related to the period of the moon phase; a slip mechanism disposed between the moon phase dial and the moon phase gear and frictionally and directly engaged between the face of the moon phase gear which opposes the moon phase dial and the periphery of the hub, the slip mechanism having means operative during the correction of the angular position of the moon phase dial for decoupling the

moon phase gear from the hub to enable the moon phase dial to be manually rotated independently of the moon phase gear, and operative during the normal operation of the clock for coupling the moon phase gear to the hub to enable the moon phase dial to be continuously rotated in response to the rotation of the moon phase gear; an hour shaft protruding from the base and driven to undergo a clock rotation at a period of rotation shorter than the period of rotation of the moon phase gear; and a reduction gear train connected between the hour shaft and the moon phase gear for continuously transmitting the clock rotation of the hour shaft to the moon phase gear at a reduction rate corresponding to the ratio of the moon phase gear rotation period to the hour shaft rotation period.

4,692,032

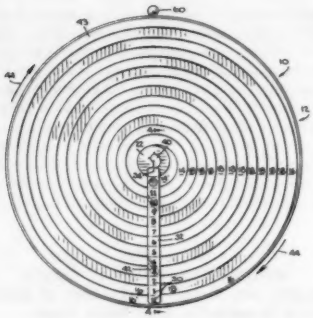
ORBIT CLOCK

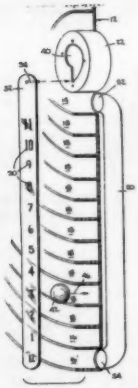
Kenneth Rubin, 33 College Pl., Brooklyn Heights, N.Y. 11201

Filed Aug. 25, 1986, Ser. No. 900,286

Int. Cl.[4] G04B *19/00, 25/00*

U.S. Cl. 368—76 **15 Claims**





1. Apparatus comprising

(A) a rotatable spiral raceway having an inner spiral, an outer spiral, and at least one intercommunicating intermediate spiral therebetween;

(B) means for supporting said raceway in a vertical orientation;

(C) means for rotaing said raceway in a given direction at a given rate;

(D) first indicator means mounted within said raceway and adapted for movement relative thereto along said spirals under the influence of gravity as said raceway rotates;

(E) a vertically extending set of indicia; and

(F) means for associating each of said indicia with respective spirals;

whereby rotation of said raceway causes said first indicator means to be lifted in a straight line from the bottom of said outer spiral to the bottom of said inner spiral, the presence of said first indictor means in a given spiral being a selection of the indicium associated with said spiral.

4,692,033

TIMEPIECE HAVING CASE FORMED OF ROCK-LIKE MATERIAL

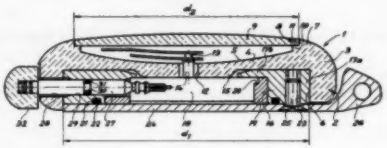
Elmar Mock, Péry, and Georges A. Gabus, Bienne, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Granges, Switzerland

Filed Apr. 2, 1986, Ser. No. 847,369

Claims priority, application Switzerland, Oct. 7, 1985, 4329/85

Int. Cl.[4] G04B *37/00*

U.S. Cl. 368—280 **1 Claim**



1. A timepiece, comprising:

(a) a case (**1**) formed at least partially from a hard natural or artificial material,

(b) a movement (**18**) housed within said case,

(c) said case comprising an inner caseband (**16**) of machinable material which includes a housing adapted to receive said movement, and an outer caseband (**3**) surrounding said inner caseband and covering entirely the edge thereof, said outer caseband being formed from said hard material,

(d) a hub portion (**4**) providing the timepiece dial (**5**) formed as one piece with the outer caseband and being concave on the dial side thereof,

(e) a crystal (**9**) covering said hub portion,

(f) means (**8**) for positioning and fastening said crystal girdling said hub portion and arranged in the outer caseband,

(g) a back cover (**24**) embedded in the outer caseband and fastened (**25**) to said inner caseband, and

(h) bracelet fastening lugs (**26**) integral with the back cover and extending out from the outer caseband,

(i) said inner caseband having an outer diameter (d_1) greater than the outer diameter (d_2) of the crystal.

4,692,034

ELECTRONIC THERMOMETER

Ryoichi Fukui, Matsuzaka, and Susumu Minamikawa, Ise, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 16, 1985, Ser. No. 809,034

Claims priority, application Japan, Dec. 17, 1984, 59-264442

Int. Cl.[4] G01K *1/08, 1/14, 7/00*

U.S. Cl. 374—208 **5 Claims**

1. An electronic thermometer, comprising:

a casing;

an electric cord accommodated within the casing so as to be pulled outwardly as desired;

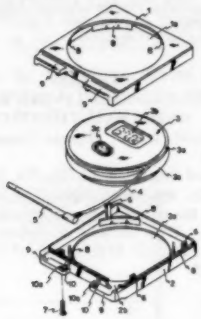
a temperature sensing probe mounted at a free end of the cord;

a main body which houses the thermometer rotatably mounted within the casing with a display field being exposed through said casing, wherein

a base portion of said cord connected to the thermometer

housed in the main body and which extends outwardly from a peripheral portion of said main body in such a manner in which said main body serves also as a reel for winding said cord therearound; and

a probe holder integral to the casing for accommodating the probe within a peripheral portion of the casing being



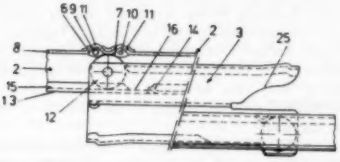
located on at least one side of the casing, and wherein the main body which houses the thermometer contains a display means with the display field for showing a temperature value, a battery for supplying power to the electronic thermometer and an electronic circuit for processing the temperature value.

4,692,035

EXTENSION PULL-OUT GUIDE ASSEMBLY FOR DRAWERS

Erich Röck, Höchst, and Felix Schwärzler, Hohenems, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed May 7, 1986, Ser. No. 860,485
Claims priority, application Austria, May 9, 1985, 1394/85
Int. Cl.[4] F16C *29/00*; A47B *88/00*
U.S. Cl. 384—18 **13 Claims**



1. A guide assembly for use on each of opposite sides of a drawer of the type wherein the drawer is slidably insertable in an insertion direction into and removable in a withdrawal direction from a body, said assembly comprising:

a pull-out rail to be mounted on a drawer;

a supporting rail to be mounted on a side of a body, said supporting rail including a lower horizontal flange having extending upwardly therefrom a vertical flange;

a center rail mounted between said pull-out and supporting rails and having rollers rollingly contacting said supporting rail;

first stop means on said supporting rail for contacting one of said rollers when the drawer is in a withdrawn position to prevent unintentional insertion of the drawer into the body from said withdrawn position, said first stop means being formed on a resilient material that is sufficiently deformable to enable said one roller to overrun said first stop means; and

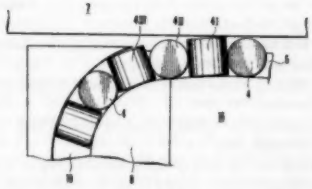
second stop means on said supporting rail for limiting movement of said one roller and said center rail in said withdrawal direction and which cannot be overrun by said one roller.

4,692,036

ROLLER BEARING FOR ENDLESS LINEAR MOTION

Yoshifumi Kawaguchi, Seki, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 939,006
Claims priority, application Japan, Jul. 18, 1986, 61-167826
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—44 **2 Claims**



1. A bearing for endless linear motion, wherein said bearing comprises

rolling elements being rollers arranged in a cross-roller mode,

a slide unit provided with an endless circuit having a linear track groove, and

a long-size track rail provided with a track groove formed in its outer face,

the track groove of the slide unit and the track groove in the outer face of the track rail being positioned opposite each other to form a load zone of the endless circulation path for the rollers,

characterized in that

a slightly inclined clearance groove is provided respectively at the both ends of the track groove on the side of the slide unit,

each angle of the clearance grooves is formed greater than the angle of the track groove, and

the boundary line formed between the track groove and the clearance groove takes shape of V, as seen from the side of the end face of the track rail, and the apex of the V-shape is porjecting to the side of the clearance groove.

4,692,037

ROLLER BEARING FOR AN INFINITE RECTILINEAR MOTION

Naomi Kasai, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,609
Claims priority, application Japan, Mar. 4, 1986, 61-46666
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—44 **2 Claims**

1. In a roller bearing for an infinite rectilinear motion comprising:

a long truck rail in which a truck face is formed on the outside face thereof;

a casing which is mounted astride the truck rail, and in

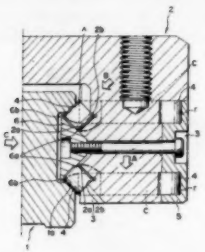
which a truck face is formed at a location opposite to the truck face of the truck rail; and

a number of rollers to be inserted between the truck face of the truck rail and the truck face of the casing;

the rollers being arranged on the basis of a parallel-roller type;

a return passage for the rollers being formed in the casing,

a side plate where a direction change passage is formed being attached to the both longitudinal end portions of the



casing, and the direction change passage connecting the truck face and the return passage,

the roller bearing for an infinite rectilinear motion is characterized in that

a twisting passage is formed in a portion of said direction change passage, and

an angle made by the axis of the roller relative to a plane in the sliding direction, viewed from the sliding direction of the bearing, will change in the twisting passage.

4,692,038

LINEAR MOTION ROLLING CONTACT BEARING ASSEMBLY HAVING A LOAD DEPENDENT VARIABLE RESISTANCE

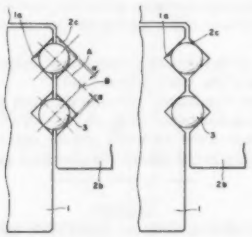
Naomi Kasai, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,636

Claims priority, application Japan, May 20, 1985, 60-73562[U]

Int. Cl.[4] F16C *31/06*

U.S. Cl. 384—45 **7 Claims**



1. A linear motion rolling contact bearing assembly, comprising:

a rail having at least one first guide groove;

a slider slideably mounted on said rail and having at least one second guide groove opposite to said first guide groove, thereby defining a load section therebetween, said slider including at least one endless path which includes said second guide groove as a part thereof;

a plurality of circular balls received in said endless path, said plurlaity of balls circulating along said endless path including along said load section as said slider moves along said rail; and

wherein said first and second guide grooves are each configured with a first surface tangently touching said balls in said load section such that each of said balls in said load section contacts at one point only with each of said first and second guide grooves at any one instant as long as an applied load by said slider remains smaller than a predetermined load operating level.

4,692,039

RECIRCULATING-BALL LINEAR BEARING AND GUIDE RAIL THEREFOR

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

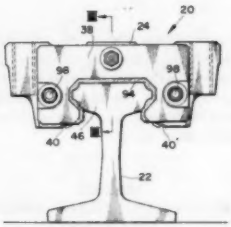
Filed Feb. 10, 1983, Ser. No. 465,646

Claims priority, application Japan, Feb. 25, 1982, 57-29454

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] F16C *29/00, 29/06*

U.S. Cl. 384—45 **14 Claims**



1. In a recirculating-ball linear bearing apparatus capable of withstanding the load acting thereon in four orthogonal directions, comprising:

(a) guide rail having two pairs of parallel raceways of arcuate cross section, each pair of raceways being vertically spaced, and angled away, from each other;

(b) a bearing body of substantially inverted-U-shaped cross section mounted astride the guide rail for rolling motion along the same and having two pairs of raceways of arcuate cross section formed longitudinally thereon in opposed relation to the two pairs of raceways on the guide rail, the bearing body also having a return passageway formed longitudinally therethrough in the vicinity of each raceway thereon;

(c) a pair of end covers secured to the opposite ends of the bearing body and each having formed therein four grooves each intercommunicating one raceway on the bearing body and one adjacent return passageway in the bearing body;

(d) groups of antifriction balls rollably interposed between the raceways on the guide rail and the raceways on the bearing body, each group of antifriction balls being capable of recirculation along one raceway on the bearing body and through one adjacent return passageway in the bearing body which are in communication with each other via two of the grooves in the end covers; and

(e) cage means for rollably holding the antifriction balls on the raceways on the bearing body and allowing the antifriction balls to make rolling engagement with the raceways on the guide rail;

the improvement wherein the guide rail comprises a flat flange base adapted to be mounted to a structure, an elongated web extending upwardly from the flange base, and a head on the top of the web, the two pairs of parallel raceways on the guide rail extending longitudinally and being formed on both sides of the head; the flange base, the web and the head being integrally formed with each

other and jointly serving as a rigid structural member of a building or a frame member of a machine.

4,692,040

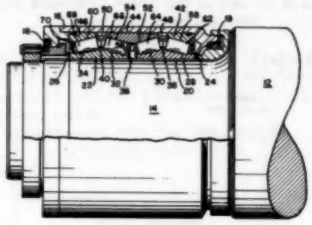
MULTIROW ROLLER BEARING WITH SEALS BETWEEN THE RACES

Roger L. Ebaugh, Winsted, and Jerry P. Rhodes, Avon, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 730,835, May 6, 1985, abandoned. This application Sep. 5, 1986, Ser. No. 904,763

Int. Cl.[4] F16C *33/78*

U.S. Cl. 384—484 **3 Claims**



1. A multirow bearing comprising: inner race means having a pair of intermediate raceways and a pair of end raceways, each end raceway tapering inwardly toward the axis of the bearing so that the small diameter ends of the end raceways are located toward the ends of the inner race means the ends of the inner race means having squared off end faces; outer race means having a pair of intermediate raceways surrounding the intermediate raceways of the inner race means and a pair of one-piece end races, each having an end raceway to provide end raceways surrounding the end raceways of the inner race means so that each raceway on the outer race means surrounds and corresponds to a different raceway on the inner race means and to provide an inner race means-outer race means annulus, the end raceway on each one-piece end race tapering inwardly toward the axis of the bearing so that the small diameter ends of the end raceways are located toward the outer ends of the one-piece end races, the outer ends of each one-piece end race extending along the same transverse plane through the axis of the bearing as the adjacent squared off inner race means end face; rollers arranged in rows between corresponding raceways of the inner and outer race means, there being a different row of rollers between each set of corresponding intermediate and end raceways, the rollers in the end racewasys being tapered rollers; individual end roller cages circumferentially separating said tapered rollers, each end roller cage having an outer end rim with a bore of larger diameter than the outside diameter of the adjacent part of the the inner raceway means; an end seal fitted with the inner race means-outer race means annulus adjacent each end of said annulus, the end seals being configured to fit entirely within said annulus, each end seal having a generally C-shaped metal seal case in cross-section with the vertical portion of the C-shape extending generally along the same transverse plane as the adjacent outer race means one-piece end race outer end and inner race means squared off end face, the horizontal parts of the C-shaped metal seal case being a generally axially extending radially inner metal portion and a shorter generally axial extending radially outer portion, said radially inner metal portion extending into the corresponding end roller cage bore, each end seal also having an elastomeric portion attached to said generally axially extending inner mctal portion and fitting substantially entirely within the corresponding end roller cage bore and cooperating with the inner race means to form barriers at the ends of the bearing.

4,692,041

DOCUMENT ENCODER

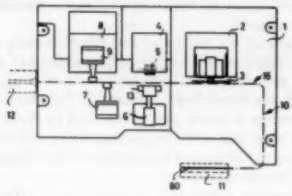
Horst Dyma, and Armin Heindke, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,608

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 3347168

Int. Cl.[4] B41J *3/54*

U.S. Cl. 400—82 **8 Claims**



1. A document encoder means encoding commercial paper, for arranged as a compact desk set including an input station for a document, a transport device transporting of the document to a storage station, said document passing several modularly designed and selectively combinable printing devices applying diverse markings partly on a front- and partly on a back side of the document, the improvement comprising: at least two printing devices arranged to act selectively respectively on the front and back sides of said document;

a chassis including installation means for carrying parts of the printing devices and print backings, the printing devices and print backings being stationary in the direction of the print lines, with only the transport device generating relative movement between the printing devices and the documents; said transport device having a U-shaped transport path extending from an input station located at the end of one leg of said transport path, all of said combinable printing devices being located along the other leg of said path;

said installation means for the printing devices and the print backings being provided along and on both sides of said other leg of said U-shaped path, such that the printing devices impacting the front- and back side of the documents operate together with the document in at least a partially overlapping way.

4,692,042

COMPUTERIZED PRINTING SYSTEM

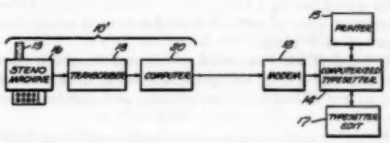
William A. Cuff, Sylmar, and Jerrold P. Lefler, Encino, both of Calif., assignors to Digitext, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 502,532, Jun. 13, 1983, Pat. No. 4,632,578, which is a continuation of Ser. No. 250,785, Apr. 3, 1981, abandoned. This application Oct. 24, 1986, Ser. No. 922,648

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.[4] B41J *3/26, 3/516*

U.S. Cl. 400—94 **4 Claims**



1. The method for translating a plurality of shorthand strokes, generated according to a preselected shorthand system, to text, comprising the steps of:

(a) storing a dictionary of a preselected shorthand system in a computer, said shorthand system comprising the utilization of distinct parameter strokes to represent each homonym, thereby distinguishing a desired word from its homonym so that said distinct parameter strokes have an unambiguous text translation, at least some of the distinct parameter strokes being predefined as pointers;

(b) then producing a computer readable record in accordance with said preselected shorthand system;

(c) then applying the computer readable record to the computer for translating such shorthand strokes of said record, the step of applying the record to the computer comprising the steps of:

(1) comparing the record against the dictionary to identify the portions of the record corresponding to said predefined pointers;

(2) using the predefined pointers in the record to locate beginnings of words not represented by distinct parameter strokes, said word beginnings being defined to be the portion of the record immediately following the predefined pointers;

(3) comparing a selected sequence of shorthand strokes starting with the first shorthand stroke immediately following the pointer, against the dictionary for locating an unambiguous match, the first located unambiguous match defining a translatable portion of the record and further defining a next pointer; and

(4) repeating steps (2) and (3) for each pointer so defined which has an untranslated portion of the record which follows immediately thereafter to define additional pointers until all of said pointers have been located and defined.

4,692,043

WIRE DOT-PRINTING HEAD

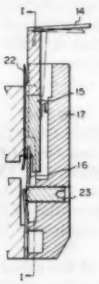
Hirokazu Ando; Kazumasa Fukushima; Yasuo Ohmori, and Tatsuya Koyama, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1986, Ser. No. 822,587

Claims priority, application Japan, Jan. 16, 1985, 60-2826

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124 **6 Claims**



1. A wire dot-print head, comprising:

a print wire;

a leaf spring having a U-shaped slit therein defining between opposite sides of said slit a tongue-shaped spring branch part of said spring;

an armature fixedly mounted on one end thereof to one end of said leaf spring, said print wire being fixedly mounted to an end of said armature opposite said one end of armature;

a leaf spring supporting member fixedly mounting thereto a fixed end of said leaf spring opposite said one end of said leaf spring, said supporting member having a threaded groove therein;

an adjusting screw threadedly engaging said threaded groove so as to be screwable therein in a direction substantially perpendicular to said tongue-shaped spring branch part into engagement with said tongue-shaped spring branch part; and

drive means for selectively electrically driving said armature.

4,692,044

INTERFACE RESISTANCE AND KNEE VOLTAGE ENHANCEMENT IN RESISTIVE RIBBON PRINTING

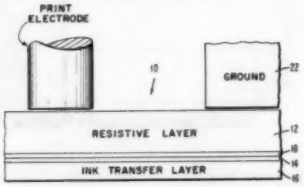
Ari Aviram, Croton-on-Hudson, and Kwang K. Shih, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1985, Ser. No. 728,996

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.[4] B41J *31/02*

U.S. Cl. 400—241.1 **18 Claims**



1. An improved resistive ribbon for electrothermal printing, comprising:

a resistive layer through which electric current passes from an electrode to produce localized heating to effect printing,

an ink layer comprised of an ink which is transferrable when heated by said localized heating,

a metal layer along which said electrical current passes, and

an electrical interface layer located between said resistive layer and said metal layer, wherein said current passes through said electrical interface layer to produce hearing due to the resistance of said electrical interface layer, said electrical interface layer increasing the interface resistance of said ribbon and introducing a non-linear current-voltage characteristic with a knee voltage in excess of 6 volts.

4,692,045

PRINTING APPARATUS CAPABLE OF CORRECTING PRINTED CHARACTERS BY OFFSET PRINTS

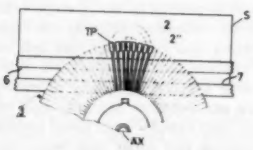
Masaru Makita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 473,205, Mar. 8, 1983, abandoned. This application May 1, 1985, Ser. No. 728,461

Claims priority, application Japan, Mar. 19, 1982, 57-42947

Int. Cl.[4] B41J *11/36*

U.S. Cl. 400—697 **9 Claims**



1. A printing apparatus for printing on a printing sheet, said apparatus comprising:

a carriage movable along a printing sheet;

printing means drivable for printing indicia on a printing sheet and mounted on said carriage for movement therewith; and

control means for controlling both the position and drive of said printing means, said control means being operable in an erasing mode for controlling the position of said printing means, at one stationary position of said carriage, to stop at a central position, at a first position which is slightly displaced away from the central position, and at a second position which is slightly displaced away from the central position in a direction opposite to displacement of said printing means from the central position to the first position, said control means further controlling said printing means to be driven at the central position, the first position and the second position, respectively, for erasing on printed indicia.

4,692,046

PEN WITH SELECTIVE MULTI-COLOR CORES

Charng-Ching Lan, No. 18, Sec. 1 Yuan Lin Road, Ta Hsi Chien, Taoyuan Hsien, Taiwan

Filed Mar. 20, 1986, Ser. No. 843,913

Int. Cl.[4] B43K *24/06, 24/14*

U.S. Cl. 401—32 **1 Claim**

1. A marking pen with a plurality of colored cores comprising:

a pen body comprising a hollow tube having a top end, a bottom end, an inner wall, and an outer wall, and a plurality of elongated tube-holding projections on the inner wall of the pen body;

a recessed groove at the top end of said pen body;

the bottom end of said pen body being cone-shaped and comprising a plurality of core outlets on the exterior thereof;

a pluriality of core-receiving tubes housed in said pen body, in the tube-holding projections, each tube having an oval cross-section and a smooth three-faceted top end, a small groove on the topmost end thereof, and a hollow interior containing fluid-absorbent material for storing ink, and a core at the bottom end;

a spring removably disposed on the bottom end of each of said core-receiving tubes;

a turnable knob comprising a top cylindrical portion and a bottom cylindrical portion, the top portion and bottom portion having differing diameters, the top portion thereof being denticulated externally, and a groove disposed on the bottom portion thereof;

an opened ring located partially on the bottom portion of said knob and partially in a recessed groove on the inner wall of said pen body;

a projecting edge on the circumference of the bottom end of said knob which is in cam engagement with the three-faceted cam surface on the top of a core-receiving tube to enable the tube to be pushed downwardly to allow the core to project out of said core outlets;

a cap attached to the bottom end of said pen body.

4,692,047

BRUSH FOR APPLYING MATERIAL IN LIQUID OR EMULSION FORM

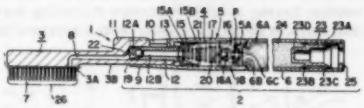
Sasuke Endo, 802, Hiroo Nashonaru Koto, 10-32, Minami Azabu 5-Chome, Minato-Ku, Tokyo-To, Japan

Continuation-in-part of Ser. No. 601,850, Apr. 19, 1984. This application Jul. 12, 1985, Ser. No. 754,835

Claims priority, application Japan, Apr. 20, 1983, 58-68450; Aug. 15, 1983, 58-148137; Feb. 8, 1984, 59-16570; Feb. 8, 1985, 60-22042; Apr. 30, 1985, 60-92877

Int. Cl.[4] B43K *5/02, 7/10*

U.S. Cl. 401—141 **15 Claims**



1. A brush for applying liquid or emulsion material comprising:

(a) a handle having a container for containing material in liquid or emulsion form and a main body, a rear end of which is connected detachably to a mouth of the container, the container having a movable bottom body which moves along an inner wall of the container as the material is sucked through the mouth of the container;

(b) a rod provided, at its head, with brush means for application of the material and slidable inserted, at its root portion, into a forward bearing portion of the main body in such a manner that rotation of the rod can be avoided and the rod can be reciprocated axially, and the rod having a material feeding passage extending from its root portion to the brush means at the head of the rod;

(c) a pumping mechanism disposed within the main body for sucking the material from the container and feeding the sucked material to the head of the rod, and operated in accordance with reciprocal axial movements of the rod, the pumping mechanism including a suction chamber disposed within the main body and sealing means within the suction chamber for keeping the suction chamber airtight in order to prevent foreign matters from being sucked thereinto and for effecting a vacuum in the suction chamber to suck the material from the container into the suction chamber, the suction chamber being in fluid communication with the material feeding passage in the rod and the mouth of the container, the sealing means being connected to the rod for reciprocal axial movement therewith for pumping material to the bursh means and sucking material out of the container;

(d) elastic means dipsosed within the suction chamber for biasing the rod in an axial position with respect to the main body of the handle;

(e) a rotation preventing means including an operational projection formed on a peripheral surface of the root portion of the rod and functioning as a pushing member on which a finger is put when the rod is pushed axially; and

(f) a slit means, axially provided in a bearing portion of the main body, for slidably receiving the operational projection.

4,692,048

PRESSURE ROLLER APPLICATOR

Duane D. Krohn, Westminister, Colo., and Allan Boogerman, Bedford, N.H., assignors to Graco Inc., Minneapolis, Minn.

Filed Jun. 9, 1986, Ser. No. 871,907

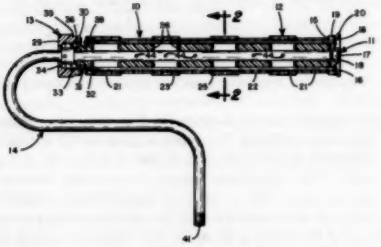
Int. Cl.[4] B05C *17/02, 1/10*

U.S. Cl. 401—197 **11 Claims**

1. A modular roller applicator sized to internally accept and fit about a pressure feed tube and to fit inside a rigid tubular permeable roller sleeve comprising,

(a) a first circular end cap, having an inner recess adapted for fitting about said feed tube and an outer circumferential surface adapted for fitting into said tubular permeable roller;

(b) a plurality of identical modular sections, each having a regular polygonal cross section having outer faces, and end surfaces, and having an elongated groove inwardly extending from each outer face and along the length thereof between each end surface, forming alternate ridges and grooves on the outer face, and the elongated grooves and the outer faces of the modular sections and the tubular permeable roller sleeve defining a plurality of reservoirs around each modular section, and each modular section having a central aperture extending between the end surfaces thereof, and each central aperture having



elongated inner slots extending outwardly therefrom along the length thereof between the end surfaces toward vertices of the polygonal cross section of each modular section whereby the inner slots overlap the outer face grooves in the adjacent modular section;

(c) a second circular end cap having an inner edge, an outer edge, and a circumferential surface adapted for fitting into said tubular permeable roller; and

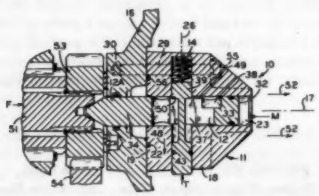
(d) an elongated fastening means extending from the first end cap to the second end cap and cooperating with the plurality of modular sections to retain the modular sections adjacently therebetween and further cooperating to axially locate and fixedly position the elongated inner slots of the one modular section confronting the elongated outer face grooves of the adjacent modular section.

4,692,049

QUICK DISENGAGEMENT APPARATUS FOR POWER WHEEL MECHANISMS

James L. Engle, Auburn, Ind., assignor to Auburn Gear, Inc., Auburn, Ind.

Filed Jun. 12, 1985, Ser. No. 743,794
Int. Cl.[4] F16D *1/06*
U.S. Cl. 403—1 **12 Claims**



1. A quick disengagement apparatus for selectively controlling a conventional disengageable power wheel assembly wherein an axially shiftable power shaft may be translated from a first position whereat said power shaft is operatively engaged with an associated hub assembly to enable mutual coaxial rotation, to, in opposition to a yieldable bias acting axially on said power shaft, maintain said engagement, a second position whereat said power shaft is disengaged from its associated hub assembly to enable independent coaxial rotations thereof, said quick disengagement apparatus comprising:

a housing, disposed in a fixed location relative to said hub assembly;

axial translatable means, carried by said housing, for communicating an axially directed external force applied thereto to said power shaft in opposition to said yieldable bias acting thereon so as to cause said power shaft to assume its disengaged position, said axially translatable means including a shoulder surface and a detent cavity formed therein at appropriate longitudinal positions respectively corresponding to said engaged and disengaged positions;

transversely translatable means, carried by said housing, for releasably interlocking with said detent cavity and for retaining said axially translatable means in its axially translated position whereat said power shaft is disengaged from said hub assembly, release of said interlocking enabling said axially translatable means to translate to its axially translated position whereat said power shaft is engaged with said hub assembly;

means for yieldably biasing said transversely translatable means into interlocking engagement with said detent cavity of said axially translatable means when said axially translatable means has attained said disengaged condition; and

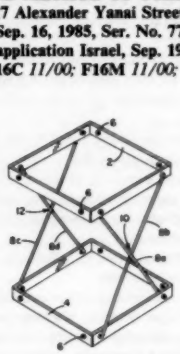
said axially translatable means further including a longitudinal slot formed diametrically therethrough at a laterally central region, the transversely translatable means extending through said slot and being supported in said housing on opposite sides of said axially translatable means, the slot enabling said axially translatable means to be shifted with respect to said transversely translatable means at least between its engaged position and its disengaged position, the assembly of the transversely translatable means through the slot of the axially translatable means allowing the transversely translatable means to serve as the sole means for retaining the axially translatable means in the housing.

4,692,050

JOINT AND METHOD OF UTILIZING IT

Yaacov Kaufman, 17 Alexander Yanai Street, Tel Aviv, Israel

Filed Sep. 16, 1985, Ser. No. 776,702
Claims priority, application Israel, Sep. 19, 1984, 73030
Int. Cl.[4] F16C *11/00*; F16M *11/00*; F16D *1/2*
U.S. Cl. 403—3 **5 Claims**



1. A joint comprising:

two members,

a plurality of apertures formed in each of said two members, and

two pairs of resilient rods positioned opposite to each other and interconnecting said two members,

each end of each rod of said two pairs of rods being pivotably mounted in an aperture defined in a different one of said two members,

one rod of each of said two pairs of rods having both its ends extending through said apertures in a direction opposite to the direction of extension through said apertures of both ends of the other rod of the same pair of rods, and

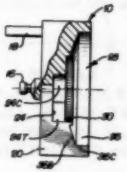
each rod of each of said two pairs of rods being mounted to cross the other rod of the same pair of rods in frictional engagement, each member thereby being pivotably movable with respect to the other member and being held in a desired position by the frictional engagement of the two rods of each of said two pairs of rods.

4,692,051

HOT WATER HEATER KNOB ADAPTOR

Benjamin H. Stansbury, Jr., 803 N. Doheny Dr., Beverly Hills, Calif. 90210, and Richard E. Henderson, 1760 Monrovia, Unit B10, Costa Mesa, Calif. 92627

Filed Dec. 6, 1982, Ser. No. 446,884
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—3 **5 Claims**



1. An adapter for coupling an automatic adjusting mechanism to different configurations of manual control knobs comprising:

(a) coupling means on a rear portion of said adapter for coupling said adapter to said mechanism;

(b) recess means on an internal front portion of said adapter for matingly receiving said different external configurations;

(c) tensioning means for securing said adapter snugly upon the relevant control knob, such that said adapter and said knob rotate one with the other; and

(d) said tensioning means applying a radially inwardly directed gripping force on said relevant control knob to secure said adpater upon same.

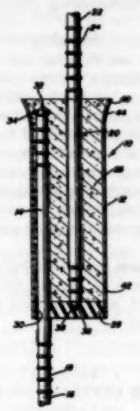
4,692,052

SPLICE SLEEVE FOR OVERLAPPING REINFORCING BARS

Alfred A. Yee, Honolulu, Hi., assignor to Elizabeth W. Yee, Honolulu, Hi.

Filed Jun. 25, 1986, Ser. No. 878,336
Int. Cl.[4] B25G *3/00*; F16D *1/00*
U.S. Cl. 403—13 **14 Claims**

7. In combination, a pair of axially extending reinforcing bars having peripheral projections thereon, said bars having overlapping ends disposed in adjacent, generally parallel spaced relation, a rigid splice sleeve with means locating said end portions of the axially extending reinforcing bars therein, and hardened medium enclosing the overlapping ends of the reinforcing bars and filling the transverse cross-sectional area of the sleeve for resisting forces perpendicular to the longitudinal axes of the reinforcing bars when axial tension is exerted on the overlapping reinforcing bars with the sleeve imposing opposite forces toward the overlapping ends of the reinforcing bars to develop a secure frictional engagement between the reinforcing bars and hardened medium to securely retain the



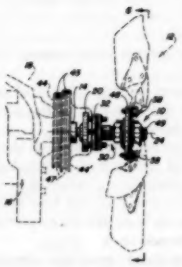
overlapping ends of the reinforcing bars in overlapped relation.

4,692,053

DIRECT DRIVE FAN COUPLING ASSEMBLY

Manuel Sampedro, 21011 S.W. 122 Ct., Miami, Fla. 33177, assignor to Manuel Sampedro, Miami and Russell T. Kohuth, Hollywood, both of, Fla., a part interest to each

Continuation-in-part of Ser. No. 842,784, Mar. 24, 1986, abandoned. This application Sep. 29, 1986, Ser. No. 912,523
Int. Cl.[4] F01P *1/00, 7/00*; F16D *1/00*
U.S. Cl. 403—24 **13 Claims**



1. A direct drive coupling assembly of the type primarily designed to rotatably support and interconnect a cooling fan structure to a drive shaft therefor in an internal combustion engine for an automobile or like vehicle absent any interceding clutch mechanism, said coupling assembly comprising:

(a) an elongated support shaft of one piece, integral construction mounted at one of two opposite ends thereof to said drive shaft and extending coaxially outwardly therefrom into supporting engagement with the cooling fan structure,

(b) connecting means for adjustably and selectively securing the cooling fan at any one of a plurality of predetermined locations along the length of said support shaft and at a preferred location relative to a radiator structure of the internal combustion engine,

(c) fan support means for interconnecting the cooling fan to said support shaft for rotation therewith mounted on said support shaft between said opposite ends thereof and

comprising a support disc having a central aperture integrally formed therein and being structured for connection to at least a portion of said connecting means, said support disc disposed in surrounding, coaxial relation to said support shaft,

(d) said support disc including a fan support structure formed thereon and disposed and configured for direct removable attachment to the cooling fan for support thereon if the cooling fan is within predetermined standard dimensional parameters, said predetermined standard dimensional parameters defined by the dimension of an inside diameter of a central bore of the cooling fan,

(e) an adaptor means removably securable to said support disc for direct attachment to and support of a cooling fan structure which is outside of said predermined dimensional parameters and therefore unattachable to said support disc,

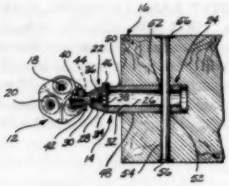
(f) said adapter means being attached to said support disc in supporting relation to the fan structure only if the fan structure utilized is outside said predetermined dimensional parameters.

4,692,054

CONNECTOR SYSTEM FOR STRUCTURAL FRAMEWORK

Charles A. Kirby, Gig Harbor, Wash., assignor to Northwest Design Products, Inc., Tacoma, Wash.

Filed Aug. 26, 1985, Ser. No. 769,484
Int. Cl.[4] F16B *7/18;* **F04H** *12/06*
U.S. Cl. 403—171 **11 Claims**



1. A connector system for structural frameworks comprising:

(a) a strut element having a first end portion and a second end, portion the first end of the strut element having a longitudinal bore therein;

(b) a bolt member having a head and shank, said bolt member beng mounted within said longitudinal bore, the head of the bolt member being retained within the bore and a portion of the shank of the bolt member extending outwardly from the bore, the shank portion having a plurality of threads formed thereon;

(c) a drive nut fixed about the shank portion and being immovable relative to the shank portion, the drive nut being configured so that rotation of the drive nut causes corresponding rotation of the bolt member; and

(d) antirotation means secured to the first end portion of the strut element and being selectively engageable with the bolt member for preventing rotation of the strut element relative to the bolt member.

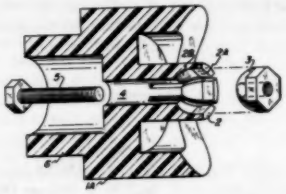
4,692,055

UNIFASTENER

Paul F. Seymour, 1104 Stillwater Dr., Jupiter, Fla. 33458

Filed Apr. 9, 1984, Ser. No. 598,033
Int. Cl.[4] F16B *7/08*
U.S. Cl. 403—190 **1 Claim**

1. A Joint fitting for connecting a pair of tubular members, are being provided with an aperture in its wall, comprising a plug having a longitudinal bore therethrough adapted at one end to fit into an end of one of the members and having a split projection at the other end adapted to enter the aperture of the other member, and expansion means longitudinally movable in the split projection for expanding the split projection on the plug for clamping engagement with the other member, said split projection terminating in a split socket having plural segments with each segment having extending axially from its free end a planar internal face and arcuate internal face together forming a socket having a generally spherical bottom and planar sides, said expansion means being a bolt extending thru said longitudinal bore and a threaded nut thereon having a generally spherical bottom at one end and terminating in planar sides at the other end for non-rotative engagement with said split socket.

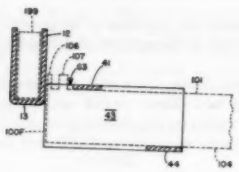


4,692,056

GARMENTS HANG-RAIL COUPLING

Joel H. Alperson, 3306 S. 157th St., Omaha, Nebr. 68130

Filed Jul. 29, 1986, Ser. No. 890,381
Int. Cl.[4] F16B *9/02*
U.S. Cl. 403—233 **11 Claims**



1. A garments hang-rail coupling securely removably mountable at the forward portion of each of a plurality of parallel horizontal brackets, each said bracket forward portion terminating as a frontal-end and being cross-sectionally rectangularly defined by left-side, right-side, bottom-side, and also by a top-side that is forwardly provided with upstanding lug means, said garments hang-rail coupling comprising:

(A) as the coupling forward portion, an upwardly open trough adapted to removably support a garments hang-rail extending perpendicularly to the bracket at the frontal-end thereof; and

(B) a housing having forward and rearward open-ends, said housing being rigidly attached at and depends from a rearward portion of said trough, said housing including:

(i) a substantially horizontal roof-panel located a finite-gap rearwardly of the housing forward open-end whereby the roof-panel is adapted to abuttably overlie the bracket top-side rearwardly of said upstanding lug means,

(ii) substantially parallel upright side-panels including a left-panel and right-panel having their upper portions rigidly attached to said roof-panel and having their forward portions rigidly attached to said trough, said left-panel and right-panel being adapted to lie alongside said bracket left-side and right-side, respectively, and

(iii) base means extending substantially horizontally between lower portions of said side-panels and being adapted to abuttably underlie the bracket bottom-side,

and said base means being relegated remotely rearwardly of said roof-panel thereby facilitating insertion of said forwardly lugged bracket through the housing rearward open-end and permitting emergence of said lug means into said housing upper finite-gap.

4,692,057

TAPER CONNECTION ON A CHAIR OR TABLE COLUMN OF ADJUSTABLE HEIGHT

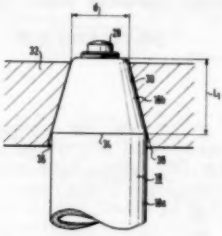
Leo Lauderbach, Steinbach, Fed. Rep. of Germany, assignor to Stabilus GmbH, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 859,085

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3517003

Int. Cl.[4] B25G *3/00*; F16M *11/00*

U.S. Cl. 403—334 **10 Claims**



1. In a combination of a height-adjustable carrier column, having a carrier column component (**18**), and a component (**32**) carried by the carrier column the improvement comprising: said carrier column component (**18**) of said carrier column comprising an integrally formed tube-shaped member having a lower cylindrical section (**18*a***) and an upper conical external taper section (**18*b***) having a nominal length (**L1**), said taper section (**18*b***) adjoining said cylindrical section (**18*a***) at the upper end thereof at a transition section (**34**), and said component (**32**) carried by the carrier column having an internal taper (**30**) for accomodating said conical external taper section (**18*b***), said internal taper (**30**) being sized relative to said external taper section (**18*b***) to protrude out beyond said conical external taper section (**18*b***) towards said cylindrical section (**18*a***) and overlies said transition section (**34**).

4,692,058

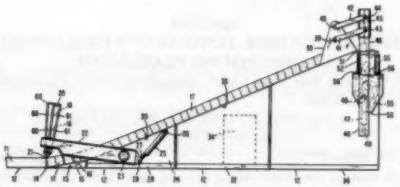
APPARATUS AND METHOD FOR REMOVING PAVEMENT

William F. Mengel, Custer, Wis., assignor to F. F. Mengel Company, Custer, Wis.

Filed Jul. 8, 1985, Ser. No. 752,686

Int. Cl.[4] E01C *23/12*

U.S. Cl. 404—72 **20 Claims**



1. An apparatus for removing road pavement, inclusive of any metal reinforcement incorporated therein, and rendering the same into small pieces for easy disposal thereafter, comprising:

movable pavement lifting means for applying a lifting force to an end of said road pavement substantially across the width of said pavement;

a first movable pavement breaking means, cooperating with said pavement lifting means, for applying a downwardly directed impact force substantially across the width of said pavement, at a predetermined position adjacent a forward end of said pavement lifting means forwardly of said pavement end being subjected to said lifting force, for generating resultant tensile forces in the lower portions of said lifted pavement under the applied impact force for breaking said pavement thereby;

movable ramp means cooperating with said pavement breaking means, substantially supported by and moving generally over the area from which said pavement has been broken by said first pavement breaking means, for lifting said broken pavement and any said metal reinforcement incorporated therein by movement behind said movable pavement lifting means; and

a second movable pavement breaking means, cooperating with said ramp means and positioned adjacent the highest point to which said ramp means lifts said broken pavement, for rendering said broken pavement and any said metal reinforcement incorporated therein into smaller pieces of predetermined size.

16. A method of breaking up and removing road pavement, inclusive of any metal reinforcement therein, comprising the steps of:

introducing an acute angled hollow wedge between an end of said road pavement and the ground below, said wedge being oriented transverse to said road and extending beyond the width of said road pavement on both sides thereof;

applying an external force directed to force said wedge forwardly under said pavement, whereby an upwardly directed force is exerted on said pavement end by an upper surface of said wedge;

applying a downwardly directed impact force substantially across the width of said pavement a predetermined distance forward of said pavement end while said wedge is exerting said upwardly directed force thereon, so that resultant tensile forces are generated in the lower portions of said lifted pavement under the applied impact force whereby a portion of said road pavement breaks and is supported by said wedge; and

repeating said application of downwardly directed impact force while maintaining said external force on said wedge, whereby additional portions of said road pavement are broken and previously broken portions are caused to slide further up along said upper surface of said wedge.

4,692,059

METHOD OF AND A MEANS FOR PROTECTING SHORES AGAINST OIL POLLUTANTS

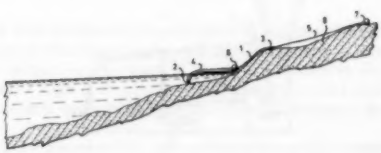
Holger Juutilainen, Tampere, Finland, assignor to Tamfelt Oy Ab, Tampere, Finland

Filed Feb. 6, 1986, Ser. No. 826,619

Claims priority, application Finland, Feb. 6, 1985, 850492

Int. Cl.[4] E02B *15/04*

U.S. Cl. 405—63 **8 Claims**



1. Method of protecting shores against oil pollutants, wherein a web-like oil-retaining textile (1) is positioned in the

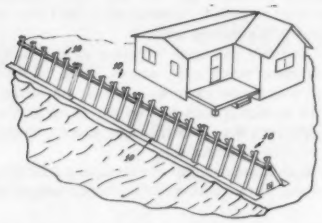
way of oil in the water to prevent the oil from spreading up on a shore, comprising the steps of (a) lowering the textile into the water in parallel with the shore and (b) drawing the textile in the direction perpendicular to the water's edge up on the shore over a strip of land (8) whichis in danger of getting polluted, in such a manner that a longitudinal edge (2) of the textile remains in the water.

4,692,060

WATER-BAG DAM OR DIKE AND METHOD

James G. Jackson, III, 424 Douglas Ave., Kalamazoo, Mich. 49007

Filed Jul. 3, 1986, Ser. No. 882,081
Int. Cl.[4] E02B *7/20, 7/50;* **E01F** *7/00*
U.S. Cl. 405—115 **18 Claims**



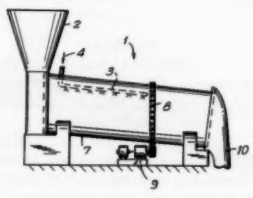
1. A water-bag dam or dike which comprises:
a closed-end tube of water-impermeable, pliable sheeting having a bottom and two side panels of substantially the same length and breadth connected to equilateral generally triangular end panels;
lateral support members in the form of an inverted V;
lateral-support-fastening means on said side panels attaching the same to said lateral support members;
longitudinal support means located between said lateral support members adjacent the apex of the V;
longitudinal-support-fastening means at the apex of said side panels attaching the same to said longitudinal support means;
water-inlet means for filling said water-bag with water whereby it is caused to assume a tubular shape having an equilateral cross section; and
water-outlet means whereby said tube can be drained.

4,692,061

PROCESS FOR DUMPING OF PARTICULATE SOLID WASTE MATERIALS IN UNDERGROUND SALT ENCLOSED CAVITIVES

Walter Lindörfer, Kassel, and Wilhelm Jahn-Held, Staufenberg, both of Fed. Rep. of Germany, assignors to Wintershall AG, Kassel, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,399
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3411998; Jun. 25, 1984, 3423387; Jul. 21, 1984, 3426960
Int. Cl.[4] B09B *3/00;* **E02D** *3/12*
U.S. Cl. 405—128 **13 Claims**



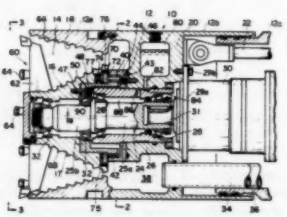
1. A process for dumping of particulate solid waste materials in an underground salt enclosed cavity containing rock salt solution and equipped with pipelines for filling and evacuation, comprising the steps of pumping out as much rock salt solution as possible from the cavity, rendering the particulate solids dust-free by treatment with a dust suppressant in an amount which does not appreciably impair free-flowing characteristics of the particulate solid waste materials, introducing the dust-free particulate solids into the pipelines used to fill the cavity until about two thirds to three quarters of the cavity is filled without dust generation, solidifying any water present in the dust suppressant together with any rock salt solution remaining in the cavity and sealing the cavity.

4,692,062

SHIELD TYPE TUNNELING MACHINE

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,388
Claims priority, application Japan, Oct. 25, 1984, 59-160343[U]
Int. Cl.[4] E21D *9/08*
U.S. Cl. 405—141 **5 Claims**



1. A shield type tunneling machine comprising:
a shield body having a front portion converging gradually rearward;
a diaphragm provided in a rear of said front portion to cross said shield body;
a crankshaft rotatably journalled by the diaphragm and having one end connected to a drive mechanism provided in a rear of said diaphragm and the other end extending to a front of said diaphragm;
a conical or frustconical rotary head supported rotatably by said other end of the crankshaft so that the axis of the rotary head is eccentric to the axis of the crankshaft, the rotary head being disposed in the front portion of said shield body;
a gear mechanism for forcibly rotating said rotary head and including an internal gear fixed to one of said diaphragm and said rotary head and an external gear fixed to the other; and
a means for discharging debris from a front area of said diaphragm to a rear area.

4,692,063

SYSTEM TO CONTROL TENSION IN A CABLE DURING UNDERGROUND PLACEMENT

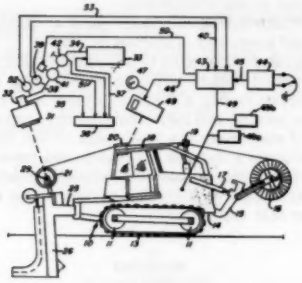
Allen C. Conti, San Jose, Calif., assignor to Arnco Corporation, Westlake, Ohio

Filed Nov. 1, 1985, Ser. No. 793,770
Int. Cl.[4] F16L *1/02*
U.S. Cl. 405—177 **10 Claims**

1. A system for controlling tension in a cable supplied from a reel carried on a land vehicle while propelled along a cable placement site, said land vehicle including an implement to prepare a subgrade for buried placement of the cable, said system including the combination of:
a capstan wheel operatively engaging the cable extending along a course between said reel and subgrade.

a drive motor connected to said capstan wheel for establishing tension on the cable extending between said capstan wheel and said reel,

control means to energize said drive motor for establishing said tension at a level less than a predetermined maximum setpoint tension level while said land vehicle advances along the cable placement site,



means for producing a tension signal corresponding to tension in the cable extending along said course, and

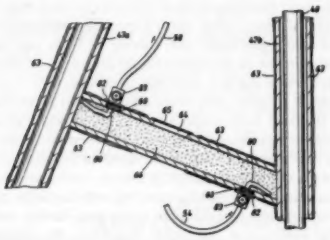
detector means responsive to said tension signal for indicating an increase in cable tension to the predetermined maximum setpoint tension level.

4,692,064

METHOD TO DRILL AND TAP A HOLLOW UNDERWATER MEMBER

Richard N. Wankmuller, New Orleans, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed Apr. 9, 1986, Ser. No. 849,645
Int. Cl.[4] E02D *5/60*
U.S. Cl. 405—211 **17 Claims**



1. A method of strengthening a hollow underwater member by converting it to a substantially solid underwater member, said method comprising the steps of:

forming fluid inlet and outlet ports through the wall of said hollow member at substantially opposite ends of said member;

ascertaining the need for strengthening said hollow member by revealing leak holes in said member caused by corrosion or structural damage; and

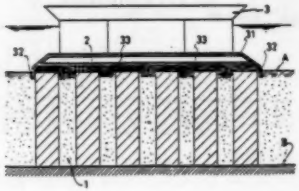
injecting grout into said member through one of said ports and discharging the fluid therein through the outer port thereof to subtantially fill said member with grout.

4,692,065

OFFSHORE UNIT STRUCTURE

Yoshio Suzuki; Mitsuoki Yamamoto, both of Tokyo, and Hisashi Hosomi, Saitama, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

PCT No. PCT/JP85/00240, § 371 Date Aug. 26, 1985, § 102(e) Date Aug. 26, 1985, PCT Pub. No. WO85/05138, PCT Pub. Date Nov. 21, 1985
PCT Filed Apr. 26, 1985, Ser. No. 774,588
Claims priority, application Japan, Apr. 23, 1984, 59-87379
Int. Cl.[4] E02B *17/00*; E02D *27/52*
U.S. Cl. 405—211 **1 Claim**



1. An offshore structure comprising:

an improved ground solidified by impregnating a cement type agent into a soft sea bottom ground and mixing them, the improved ground having at least one top open vertical hole;

a rubble mound laid on the improved ground;

a unit structure installed on the rubble mound;

a skirt extending downwardly from a lower periphery of the unit structure and encircling an upper part of the improved ground; and

at least one raised strip which is provided at an underside of the unit structure and which is thrust into the rubble mound;

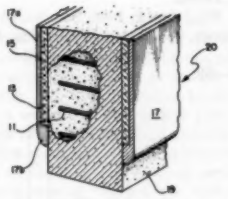
wherein a part of the rubble mound is pressed into an upper part of the vertical hole by the vertical load of the unit structure.

4,692,066

CATHODIC PROTECTION OF REINFORCED CONCRETE IN CONTACT WITH CONDUCTIVE LIQUID

Kenneth C. Clear, 201 Davis Dr., Unit GG, Sterling, Va. 22170

Filed Mar. 18, 1986, Ser. No. 840,737
Int. Cl.[4] E02D *31/06*
U.S. Cl. 405—216 **20 Claims**



1. A steel reinforced concrete structure adapted for contact with conductive liquid, and particularly for contact with saline water subject to variations in level, said variations thereby creating a high corrosion zone for steel reinforced concrete that comes in and out of liquid contact, said structure comprising:

an anode assembly adjacent to the surface of said reinforced concrete and located at least in part along said high corrosion zone;

a grout in contact with said anode assembly as well as in

contact with said reinforced concrete, said grout having a low specific resistivity; and

an air porous concrete covering over said grout, said concrete covering having a high specific resistivity.

4,692,067

CONTROL SYSTEMS

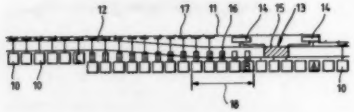
Richard Ward, Worsley, and Archelaius D. Allen, Preston, both of England, assignors to Dobson Park Industries Plc., Nottingham, England

Filed Jun. 18, 1984, Ser. No. 621,388

Claims priority, application United Kingdom, Jun. 21, 1983, 8316838

Int. Cl.[4] E21D *23/12*

U.S. Cl. 405—302 **17 Claims**



1. A mine roof support system suitable for use along a working face of a long wall mining operation, said working face having first and second face ends, said system comprising:

a plurality of mine roof supports, each support comprising:

hydraulic rams for controlling the height of said support;

hydraulic valve means for controlling said hydraulic rams; and

rotary electric motor means for operating said hydraulic valve means; and

control means for controlling said system, said control means including:

an electronic control box mounted on each mine roof support; and

face end computer means positioned at at least one of said first and second face ends, said computer means being connected to said electronic control boxes for receiving control signals from said electronic control boxes and for transmitting control signals to said electronic control boxes.

4,692,068

APPARATUS FOR DISTRIBUTION AT A REGULATED RATE OF A FLUIDIZABLE POWDERY MATERIAL

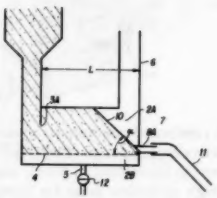
Jean-Pascal Hanrot, Aix-En-Provence, and Jacky Volpeliere, Gardanne, both of France, assignors to Aluminium Pechiney, Gardanne, France

Filed Jan. 8, 1986, Ser. No. 817,121

Claims priority, application France, Jan. 8, 1985, 85 00469

Int. Cl.[4] B65G *53/18*

U.S. Cl. 406—89 **2 Claims**



1. An apparatus for the distribution at a regulated rate of a fluidizable powdery material, comprising:

a casing divided into upper and lower parts by a porous fluidization wall and having a vertical face;

material storage means connected to one end of said upper part of said casing opposite said vertical face by a feed column;

a balancing and degassing column connected to another end of said upper part of said casing adjacent said vertical face;

means for regulating a distribution rate of said powdery material from said casing, said means for regulating comprising an outlet orifice connected to said vertical face at a vertical position immediately above said porous fluidization wall and having a controlled sectional area smaller than that of said vertical face;

means for introducing fluidization gas at a regulated pressure into said lower part of said casing; and

an outlet nozzle connected to said outlet orifice and having a horizontal bottom surface extending from the orifice, said nozzle having a diameter greater than that of said orifice, wherein said feed column is connected to an upper wall of said casing at a lower edge of said feed column, and wherein a distance L between said lower edge and said vertical face is such that unfluidized material delivered from said feed column to said casing reaches no further than said orifice.

4,692,069

CUTTER HEAD

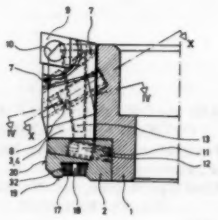
Walter Kieninger, Lahr, Fed. Rep. of Germany, assignor to Walter Kieninger GmbH, Diamantwerkzeugfabrik, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,390

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441821

Int. Cl.[4] B23C *5/24*

U.S. Cl. 407—39 **12 Claims**



1. A cutter head having a substantially cylindrical main body and a plurality of replaceable cutting members disposed at the periphery of said main body and having at least one cutting edge extending in the axial and/or radial direction of said main body, wherein each cutting member is mounted on a carrier member secured to said main body and adapted to be radially and axially adjusted with respect to said main body by means of separate adjustment means disposed between said main body and said carrier member, and to be fixed in position on said main body with the aid of clamping means, each carrier member being mounted in a groove extending substantially radially of the axis of rotation of said main body and having substantially parallel surfaces in the radial direction, the adjustment means for the axial adjustment of said carrier member comprising an axial adjustment wedge which is disposed on the side of said carrier member opposite to the intended axial advance direction of said main body and provided with a substantially radially extending threaded bore in alignment with a threaded bore in said main body, the two threaded bores being adapted to be threadedly engaged by a differential screw for the displacement of said axial adjustment wedge, and the adjustment means for the radial adjustment of said carrier member comprising a radial adjustment wedge which is disposed on the side of said carrier member facing away from the direction of intended rotation of said main body and adapted to be engaged with a substantially radially outwardly facing engagement surface of said carrier member, and the main body being

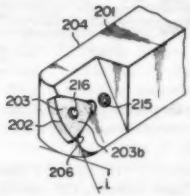
formed with a substantially axially extending threaded bore adjacent said radial adjustment wedge adapted to be threadedly engaged by a headed screw, the bottom side of the head of said screw being adapted to be engaged with said radial adjustment wedge for displacing the radial adjustment wedge.

4,692,070

CUTTING TOOL

Hiroshi Shikata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 657,126, Oct. 3, 1984, Pat. No. 4,636,117. This application Aug. 26, 1986, Ser. No. 900,410
Claims priority, application Japan, Apr. 12, 1984, 59-73570
Int. Cl.[4] B23B *27/00, 27/16*
U.S. Cl. 407—104 **12 Claims**



1. An oblique edged cutting tool for machining a work, comprising:

(a) a holder having a front end;

(b) an indexable throw-away tip comprising:

(1) a curved surface projecting outwardly;

(2) a flat surface;

(3) a curved cutting edge defined by a contacting line between an edge of said curved surface and an edge of said flat surface; and

(4) an outer configuration radially symmetrical about a geometric center of said tip;

(c) means for releasably securing said tip to said front end; and

(d) means for positioning said tip at an inclination angle of from about 30° to about 70° so that said flat surface constitutes a rake face and is positioned substantially normally to a surface of the work to be machined and said curved surface projects outwardly from the front end of said holder so that said curved cutting edge projects forwardly when said tip is secured to said holder;

wherein said inclination angle is defined as an angle formed by (1) a line tangent to substantially the central portion of an effective cutting edge portion of said cutting edge and (2) a line normal to a cutting velocity direction of said cutting tool and parallel to said work surface.

4,692,071

THREAD CUTTING MACHINE

Akio Hirota, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

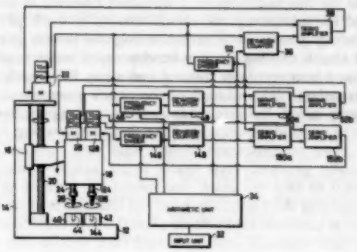
Filed May 12, 1986, Ser. No. 861,821
Claims priority, application Japan, Jun. 28, 1985, 60-143346
Int. Cl.[4] G05B *19/407*
U.S. Cl. 408—9 **7 Claims**

1. A thread cutting machine, comprising:

a workpiece supporting stand having a surface for holding a workpiece; a spindle head movably supported with respect to said workpiece supporting stand; means to move said spindle head in opposite directions towards and away from said workpiece holding surface; a rotatable spindle for holding a thread cutting tool, said spindle being rotatably supported by said spindle head; and means for rotating said spindle;

first and second means operable to control the position of said thread cutting tool;

said first means being responsive to said spindle head moving means to generate a signal corresponding to the movement of said spindle head; and



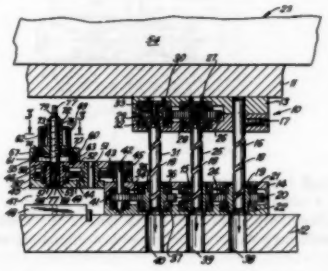
said second means for rotating said spindle in accordance with said signal to synchronize the amount of movement per revolution of said spindle with the movement of said spindle head relative to said workpiece holding surface.

4,692,072

TAPPING DEVICE FOR RECIPROCATIVE PRESS

William R. Pfister, Brick, and William H. Pfister, Seaside Park, both of N.J., assignors to Automated Tapping Systems Inc., Bricktown, N.J.

Filed Jul. 25, 1986, Ser. No. 889,206
Int. Cl.[4] B23B *47/18*
U.S. Cl. 408—124 **11 Claims**



1. A tapping device for a punch press or the like comprising a top plate, a bottom plate opposite the top plate, electrical power means to reciprocate the top plate with respect to the bottom plate, a top gear block secured to the top plate, a bottom gear block secured to the bottom plate, a gear train carried within each of the gear blocks, a helically grooved first cam shaft secured at one end to the top gear box and extending therefrom, a first helically splined bushing carried within the bottom gear box in driving engagement with the first cam shaft, a first gear within the bottom gear train around the first bushing and secured thereto, a floating second gear within the bottom gear train in mesh with said first gear, a second helically grooved cam shaft operatively coupled at one end to the floating second gear and extending outwardly thereof toward the top gear block, a second helically splined bushing within the top gear block in driving engagement with the second camp shaft, a third gear within the top gear train around the second bushing and secured thereto, a fourth gear within the top gear train in mesh with the third gear, a third helically grooved cam shaft, secured at one end to the fourth gear and extending outwardly thereof toward the bottom gear block, a

third helically splined bushing within the bottom gear block in driving engagement with the third cam shaft, a fifth gear around the third bushing and secured thereto, an extension on the bottom gear block, a pinion gear member within the extension in mesh with the fifth gear, a tap receiving tapping station carried by the extension, a chuck assembly on the tapping station, a chuck driving gear in the chuck assembly, a tapping head on the said station, a threaded bushing in said tapping head for advancing the chuck toward a work part, a speed reducing gear train interconnecting the pinion gear member and chuck driving gear, whereby rapid reciprocation of the top and bottom plates toward and away from each other will be translated into rotation of the chuck assembly at a suitable tapping speed, fail safe means within the tapping head responsive to vertical movement of the threaded bushing to interrupt the plate reciprocation means, said first, second and third helically grooved cam shafts being axially stationary with respect to said top plate, and means for permitting said first, second and third helically grooved cam shafts to extend downward at least into said bottom plate during reciprocation of said top plate whereby motion of said first, second and third helically grooved cam shafts into said top plate is not required.

4,692,073

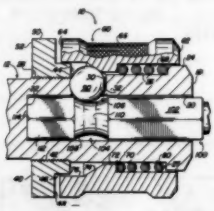
HANDLE ADAPTER AND CHUCK APPARATUS FOR POWER BITS

J. Richard Martindell, P.O. Box 490, Hill Rd., Bernalillo, N. Mex. 87004

Continuation of Ser. No. 704,949, Feb. 25, 1985, abandoned. This application Jul. 1, 1986, Ser. No. 880,811

Int. Cl.[4] B23B *31/22*

U.S. Cl. 408—239 A **19 Claims**



1. Hand tool apparatus including a handle for a tool bit having a non-circular shank and having a groove extending circumferentially about the shank with a flat center portion and a radiused portion on the groove, comprising, in combination:

spindle means including

a non-circular bore having an inner end for receiving the non-circular shank of the tool bit,

a radial bore communicating with the non-circular bore, and

a ball having a radius substantially the same as, or slightly less than, the radiused portion of the groove of the tool bit disposed in the radial bore and extendable into the non-circular bore and against the radiused portion of the groove of the shank of the tool bit for locking the tool bit within the non-circular bore and against the inner end of the non-circular bore;

sleeve means disposed about the spindle means, and including

a front bore disposed about the spindle means,

a conically tapered bore disposed adjacent to the radial bore and disposed against the ball, and

a rear bore adjacent to the conically tapered bore for receiving the ball when the ball is moved out of the non-circular bore; and

spring means for biasing the sleeve means against the ball whereby the conically tapered bore contacts the ball to apply normal and tangential forces against the radiused portion of the shank to lock the bit in the non-circular bore and against the inner end of the non-circular bore to prevent longitudinal movement of the tool bit.

4,692,074

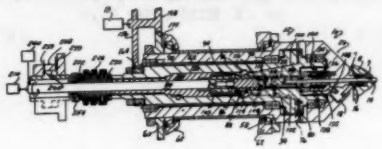
TOOL COUPLING ARRANGEMENT FOR A TOOLING ASSEMBLY

Michael D. Smith, Troy, and Daniel F. Dobat, Sterling Heights, both of Mich., assignors to The Cross Company, Fraser, Mich.

Filed Apr. 11, 1986, Ser. No. 850,652

Int. Cl.[4] B23B *31/26*

U.S. Cl. 409—233 **15 Claims**



1. A tool coupling arrangement of the type adapted to detachably couple a tooling assembly **(10)** insertable into a spindle assembly **(12)**,

said tooling assembly **(10)** having a plurality of elements, at least one of said elements **(20)** axially moveable independently of the other elements of said tooling assembly **(10)**;

drive means **(54, 56, 156, 164, 158)** for rotating each of said elements about aligned axes of rotation;

an inner draw bar **(84)**;

an outer draw bar **(82)**;

each of said inner and outer draw bars **(84, 82)** mounted in said spindle assembly **(12)** for independent axial movement therein;

actuator means **(210, 258)** for axially moving said inner and outer draw bars **(84, 82)** independently in said spindle assembly **(12)**;

first coupling means **(30, 86, 92)** operable by axial movement of said outer draw bar **(82)** to couple said tooling assembly **(10)** to said spindle assembly **(12)**, characterized by:

second coupling means **(116, 108, 240, 224)** operable upon limited axial advance of said inner draw bar **(84)** to couple said independently moveable element **(2)** of said tooling assembly **(10)** to said inner draw bar **(84)** for axial movement together therewith.

4,692,075

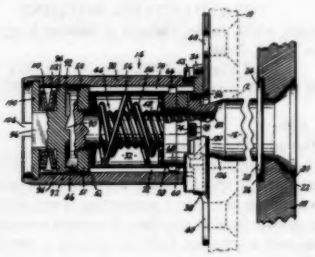
PANEL FASTENER

Joseph R. Metz, Ridgefield, Conn., assignor to Norco,Inc., Ridgefield, Conn.

Filed May 2, 1986, Ser. No. 858,643

Int. Cl.[4] F16B *31/00*

U.S. Cl. 411—7 **18 Claims**



1. A fastener for releasably securing a panel to an underlying

supporting structure having an access opening, comprising in combination:

(a) a tubular housing having a longitudinal bore,

(b) means for securing said housing to the supporting structure, with the bore of the housing located at the access opening thereof,

(c) a screw member carried in the housing bore, having a threaded portion extending toward an open end thereof and accessible from said access opening, said screw member having a head disposed in said housing,

(d) the panel having an opening adapted to be located at the access opening in the supporting structure,

(e) a stud having a bore with internal threads adapted to mate with the threaded portion of the screw member when the panel is placed over the supporting structure with its opening adjacent said access opening and the stud engaged with and turned with respect to the screw member,

(f) a detent device in said housing for engagement by the stud to prevent inadvertent rotation thereof with respect to the housing and consequent loosening thereof on the screw member under conditions of vibration,

(g) means providing a movable mounting for the screw member in the housing to enable turning movement, and

(h) a yieldable uni-directional detent means carried by the housing and continually engaging the head of the screw member so as to normally prevent its turning in one direction during application of the stud to the threaded portion of the screw member except under conditions of excessive torque, thereby reducing the likelihood of damage occurring to the screw member or stud from possible overtightening,

(i) said uni-directional detent means at all times positively preventing turning of the screw member in the opposite direction so as to insure removal of the stud therefrom when the latter is turned in unscrewing direction.

4,692,076

EXPANSION DOWEL WITH ANCHORED STATE INDICATOR

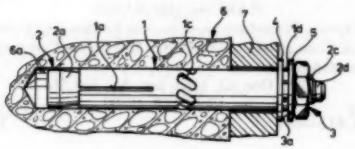
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to "L'Oreal" , Paris, France

Filed Feb. 26, 1986, Ser. No. 833,813

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1985, 3507022

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—55 **4 Claims**



1. Expansion dowel comprising an axially elongated cylindrically shaped expansion having a leading end arranged to be inserted first into a borehole in a receiving material in which the expansion dowel is anchored and a trailing end, an expansion body located at the leading end of said expansion sleeve and shaped to expand an axially extending section of said expansion sleeve from the leading end thereof when the expansion body is drawn axially into the leading end of said expansion sleeve toward the trailing end thereof, an axially elongated bolt having a leading end and a trailing end with the leading end thereof secured to said expansion body and said bolt being threaded for an axially extending section from the trailing end toward the leading end, means engageable with the threaded section of said bolt for drawing the expansion body into the leading end of said expansion sleeve, and said means forming a shoulder for securing a load on said dowel, said expansion sleeve having an axially deformable region intermediate the leading and trailing ends thereof, wherein the improvement comprises an annular disc encircling and fitted on the outside of said expansion sleeve adjacent the trailing end thereof and spaced axially from said shoulder, said disc acts as an axial stop for the initial insertion of said expansion sleeve into a receiving material, means on said sleeve for securing said disc against axial displacement toward said shoulder, and said disc being axially displaceable on said expansion sleeve toward said shoulder and overcoming said securing means after a minimum anchoring value has been achieved as said expansion body expands said expanding sleeve in the axial direction extending from the leading end thereof, and said axially deformable region being deformable only when said minimum anchoring value is achieved so that the axial deformation of said sleeve and the displacement of said disc overcoming said securing means takes place at the same time, said means for securing said disc are deformable members, said deformable members are formed as circumferentially spaced protuberances extending outwardly from the outside surface of said sleeve, and a spacing disc is positioned around the outside surface of said expansion sleeve between said protuberances and said shoulder.

4,692,077

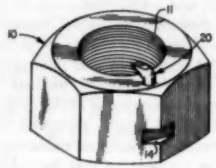
SELF-LOCKING NUT WITH ROCKING ANTI-REVERSING PIN

Jack R. Kerr, 15015, Arlington, Tex. 76015; Thomas V. Shelton, #6 Woodland Dr., Mansfield, Tex. 76014, and Jerry L. Dunsmore, #5 Woodlands Dr., Mansfield, Tex. 76063

Filed Dec. 30, 1985, Ser. No. 814,904

Int. Cl.[4] F16B *39/30*

U.S. Cl. 411—206 **13 Claims**



1. In a self-locking nut which includes: an annular body having internal threads; said body having a small bore at one side parallel to the thread axis thereof; an L-shaped anti-reversing pin fabricated from an elastic material, having one leg disposed within said small bore and having its other leg extending generally radially from said bore toward said thread axis for interference engagement with a mating bolt; said one leg having a latching recess disposed adjacent to its free end and facing away from said other leg; said latching recess being engaged by displaced metal of said nut body flowed into said small bore to retain said pin within said bore; the improvement comprising

said latching recess including two contiguous abutment surfaces disposed in intersecting planes parallel to the longitudinal axis of said one leg and inclined at respective selected acute angles from a reference plane parallel to said longitudinal axis and perpendicular to the plane defined by the legs of said pin;

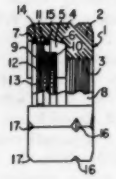
said displaced metal of said body being disposed within said recess to limit oscillation of said free end of said one leg within said small bore through the alternating abutting of said two abutment surfaces with said displaced metal, to allow swinging of said other leg of said locking pin between alternative anti-reversing positions with resultant reduced stress on said locking pin.

4,692,078

NUT DEVICE HAVING AUTOMATIC POSITIVE LOCKING

Alexis A. J. Dessouroux, Belgique, Belgium, assignor to Shurlok International S.A., Belgique, Belgium

Continuation of Ser. No. 526,810, Aug. 26, 1983, abandoned. This application May 23, 1986, Ser. No. 870,302
Claims priority, application France, Aug. 30, 1982, 82 14808
Int. Cl.[4] F16B *39/12*
U.S. Cl. 411—231 8 Claims



1. A nut device having an automatic positive locking, comprising a nut having a longitudinal axis and an internal screwthread, a cavity in the nut, a collar constituting a brake disposed in the cavity and having an internal screwthread substantially similar to the screwthread of the nut, means for retaining the collar in the cavity, means for connecting the collar to the nut so as to cause the collar to rotate with the nut, the collar being axially movable in the cavity between an innermost position in the cavity in which its screwthread is in phase with the screwthread of the nut and an outermost position relative to the cavity in which said screwthreads are no longer in phase with each other, elastically yieldable means interposed between the collar and the nut for biasing the collar in a direction from said innermost position to said outermost position, the collar including axially extending internal keying means formed in the internal screwthread of the collar for cooperating with complementary axially extending external keying means formed in threads of a screwthreaded shaft on which the nut is adapted to be screwed, so that the collar is capable of being immobilized in rotation on said shaft when, in the course of screwing the device on the shaft, the collar is moved by the shaft away from said innermost position toward said outermost position in the cavity and has engaged said external keying means on the screwthread of the shaft and the screwthreads of the collar and the nut are no longer in phase with each other and the collar is freely axially slidable along the shaft, without rotating relative to the shaft and relative to the nut, to said outermost position under the action of said elastically yieldable means, said cavity having an outwardly divergent frustoconical shape and a diameter greater than the diameter of said collar and a radially inwardly extending first flange defining an opening having a diameter which is substantially equal to the diameter of the collar, said collar having a cylindrical body and a radially extending second flange having a diameter roughly equal to the diameter of said opening defined by the first flange, the device further comprising, for retaining the collar in the cavity, a resilient ring which is disposed between the first flange and the second flange and has a section in a plane perpendicular to said axis whose diameter is greater than the opening defined by the first flange, and said elastically yieldable means comprise a resilient split ring disposed at the rear of the collar between the second flange and an axially inner end of said frustoconical cavity and operative to resiliently bias the collar outwardly toward the first flange to said outermost position.

4,692,079

BOWED INTERNAL SPRING RETAINING RING THAT FUNCTIONS REGARDLESS OF ITS ORIENTATION WHEN INSTALLED IN A GROOVE

Edmund F. Killian, Merrick, and Wallace H. Berliner, Woodside, both of N.Y., assignors to Waldes Truarc Inc., Long Island City, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,703
Int. Cl.[4] F16B *21/18*
U.S. Cl. 411—353 4 Claims

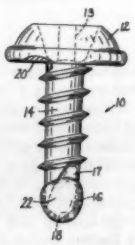
1. In combination, a first component having an internal annular groove, a bowed internal spring retaining ring disposed in said groove, and a second component retained by said ring, said ring being formed of a spring material and comprising a middle section, a pair of spaced apart end sections, and a pair of intermediate sections connecting said middle section with said end sections, said intermediate sections each including a generally radially outwardly projecting first tab, said middle section including a generally radially outwardly projecting second tab, said end sections each including a generally radially outwardly projecting third tab, said ring being symmetrically bowed about an imaginary transverse line disposed between said middle section and said end sections and passing through said intermediate sections, said second tab and said third tabs being flat and coplanar, said flat second tab and said flat third tabs being longer in the radial direction than the radial depth of said groove so as to project radially inwardly beyond said groove and into the path of said second component.

4,692,080

SELF DRILLING FASTENERS AND PROCESS FOR MAKING THE SAME

Jacob Hyner, Waterbury, and Steven Gradowski, Torrington, both of Conn., assignors to Whyco Chromium Company, Inc., Thomaston, Conn.

Filed Dec. 13, 1985, Ser. No. 808,514
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411—387 1 Claim



1. A fastener comprising, a screw having a tip area configured as a drill point said tip area being free of corrosion resistant metal electroplating and covered with a cured, frangible

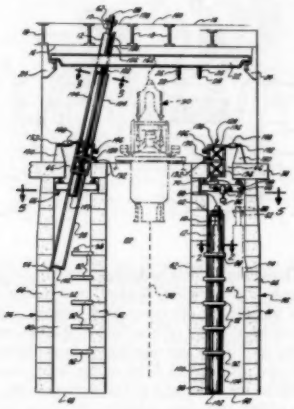
coating having a thickness of between 0.01 inches (0.25 mm) and 0.10 inches (2.54 mm), the uncoated remainder of said screw being covered with a deposit of a corrosion resistant electroplated metal having a thickness of from about 0.001 inches (0.025 mm) to about 0.003 inches (0.076 mm).

4,692,081

RISER PIPE ELEVATOR

William Bennett, Ste. 2100, 935 Gravier St., New Orleans, La. 70112, and Angel F. Jimenez, P.O. Box 2769-70459, Slidell, La. 70458

Filed Feb. 25, 1985, Ser. No. 705,102
Int. Cl.[4] E21B *19/14*
U.S. Cl. 414—22 **25 Claims**



15. A method for storing and retrieving a riser pipe, comprising the steps of:

providing an upright annular magazine comprised of an inside annular wall and an outside annular wall, the magazine having an open top;

storing the riser pipe in a substantially vertically oriented position within the annular magazine; and

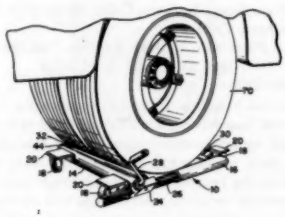
moving the riser pipe upwardly through the open top of the annular magazine at an angle to the vertical along at least a portion of the length of the riser pipe.

4,692,082

ADJUSTABLE DUAL-WHEEL CADDY

Otis O. Smith, Box 352, Frankston, Tex. 75763

Filed Dec. 17, 1985, Ser. No. 809,780
Int. Cl.[4] B66F *9/12*
U.S. Cl. 414—429 **1 Claim**



1. An adjustable wheel caddy comprising:

a normally horizontally disposed U-shaped support having opposed legs and a connecting bight therebetween, said bright having an integral rack on an upper surface thereof, one of said legs being integral with said bight and one of said legs being movable, said support being adapted to receive a wheel on the upper portion of said legs;

opposed roller members mounted internally to said support, said members extending along the internal surfaces of said opposed legs and disposed so that when a wheel is resting on said caddy it will be supported on said rollers;

wheel means affixed to the lower surface of said U-shaped support for permitting horizontal movement of said caddy; and

adjustment means connecting said movable leg and the bight for displacing said leg toward or away from the leg, said adjustment means including a manual actuator means for permitting displacement of said movable leg only in response to said actuator means so that when a wheel is supported thereon the weight thereof will not displace the leg, said adjustment means comprising

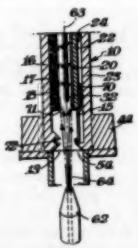
a sleeve and upwardly extending housing mounted on an end of said movable leg adjacent said bight, said sleeve slidably receiving said rack, a spur gear rotatably mounted within said housing in mesh with said rack, a worm gear rotatably mounted within said housing in mesh with said spur gear and a crank handle integral with said spur extending upwardly and outwardly from said housing and being rotatable relative thereto to drive said spur which in turn translates rotation to linear movement of said sleeve, housing and movable leg along said rack whereby said bight will be increased or decreased in length only in response to rotation of said crank handle.

4,692,083

METHOD AND APPARATUS FOR AIR JET ASSISTED FILM UNLOADING FROM X-RAY CASSETTES

Donald F. LeRoux, Elkton, Md., and Quayton R. Stottlemyer, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 22, 1984, Ser. No. 643,186
Int. Cl.[4] G03B *42/04*
U.S. Cl. 414—411 **12 Claims**



1. An x-ray cassette unloading apparatus, said cassette having adjacent plates contacting a film sheet therebetween and an exit slot, said apparatus having a housing defining a film sheet entrance slot and guide means adapted to position the cassette exit slot in alignment therewith, said apparatus including:

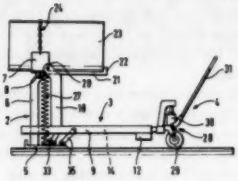
means to separate said plates, and means to direct a fluid stream through said entrance and exit slots of sufficient momentum to loosen a film sheet from contact with the cassette plates, thereby permitting the film sheet to slide freely from the cassette into the entrance slot.

4,692,084

LIFTING APPARATUS

Bertil Persson, Stora Uppåkra 6, S-225 90 Lund, Sweden

Filed Nov. 25, 1985, Ser. No. 802,052
Claims priority, application Sweden, Nov. 28, 1984, 8405994
Int. Cl.[4] B65F *3/00*
U.S. Cl. 414—607 **9 Claims**



1. A lifting apparatus operable by a lift truck provided with a lift fork movably mounted on lift means, wheel means and a power unit, which lifting apparatus comprises:

(a) a base member;

(b) a lifting unit connected by means of pivotal linkage means to the base member and movable relative thereto:

(c) the base member including means for selective engagement by the wheel means of the lift truck;

(d) the lifting unit including means engageable by the lift fork of the lift truck; and

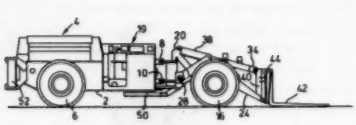
(e) wherein when the wheel means of the lift truck are in overlying engagement with the base member, the lift fork of the lift truck may impart a lifting movement to the lifting unit while the base member resting on a support surface remains in a stationary position on said support surface, and when the wheel means of the lift truck are not in engagement with the base member and the lift fork changes lateral position relative to the engageable means of the lifting unit, the lift fork of the lift truck may lift both the lifting unit and the base member from said support surface.

4,692,085

MATERIAL HANDLING SYSTEM

Michael Parsons, Sudbury, Canada, assignor to Teledyne Canada Limited, Thornbury, Canada

Filed Oct. 22, 1985, Ser. No. 790,131
Claims priority, application Canada, Feb. 27, 1985, 475349
Int. Cl.[4] B66F *7/00*; B66C *23/72*
U.S. Cl. 414—633 **10 Claims**



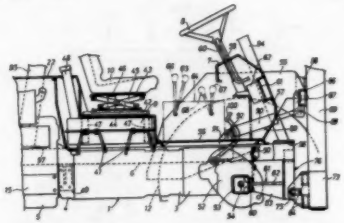
1. A vehicle having a chassis, a prime mover, and an operating console, a first set of driven wheels supporting the chassis, a subframe articulated by pivot means in a vertical axis to one end of the chassis by a second set of wheels supporting the subframe, and means to swing said subframe about the pivot to steer the vehicle; wherein a linkage is mounted to said subframe and extends away from the chassis relative to said pivot so as to swing laterally with the subframe, and a counterweight is mounted on the subframe extending in the opposite direction to the linkage so as to swing with the subframe beneath the chassis, the linkage having a rear generally vertically extending link supported or formed by the subframe, a front generally vertically extending link located forwardly of the second set of wheels and supporting lifting fork means, upper and lower longitudinal links extending generally forwardly from pivotal connections to the rear link to upper and lower spaced pivotal connections to said front link, first actuator means operable to cause relative longitudinal displacement of the upper and lower pivotal connections on the front link, whereby to tilt the front link and hence the lifting fork means backward or forward relative to the subframe, and second actuator means operative to swing the front ends of the upper and lower links up and down relative to the subframe whereby to raise and lower the front link and the lifting fork means.

4,692,086

LOAD HANDLING VEHICLE

Shigeru Morita, and Nobuhide Yanagawa, both of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 25, 1985, Ser. No. 801,338
Claims priority, application Japan, Nov. 27, 1984, 59-180274[U]; Nov. 27, 1984, 59-251077
Int. Cl.[4] B66F *9/075*
U.S. Cl. 414—635 **16 Claims**



1. A load handling vehicle including steering means disposed between a pair of front wheel fenders on opposite sides of the body of the vehicle for covering front wheels, a front cover disposed between the pair of front wheel fenders and covering the lower portion of the steering means from the front, a load handling device disposed in front of the front cover and tiltably attached to the front end of the vehicle body, and a pair of opposite tilting cylinders provided between the load handling device and the vehicle body for tilting the device, the load handling vehicle being characterized in that a main frame extends longitudinally of the vehicle and is fixed to each side of the vehicle body at a plurality of locations spaced apart longitudinally thereof, each of the tilting cylinders extending longitudinally of the vehicle and positioned above and close to the corresponding main frame in the vicinity of the front wheel fender inside thereof, each tilting cylinder being connected to a bracket on the main frame in the vicinity of and above a front axle supporting the front wheel, each tilting cylinder terminating at a position below the steering means,

the load handling device is tiltably mounted on a support member extending downward from the front end of each main frame, and the support member is connected by a reinforcing member to a front axle case attached to each side of the vehicle body for supporting the front wheel.

4,692,087

HANDLING SYSTEM AND METHOD FOR SHIP CONSTRUCTION AND REPAIR

Ralph A. Olsen, Santa Barbara, Calif., assignor to Ametek, Inc., Santa Barbara, Calif.

Filed Nov. 4, 1983, Ser. No. 549,268
Int. Cl.[4] B66F *9/00, 9/06*
U.S. Cl. 414—680 **8 Claims**

6. A material handling apparatus comprising:

a horizontal base having a width and front and rear portions;

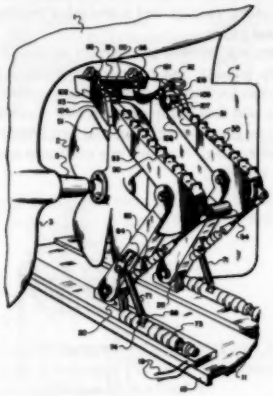
lower arm means comprising a pair of spaced-apart lower arms, each having top and bottom ends, lower pivot means on the bottom end of each lower arm and the base for pivotally mounting the bottom end of each lower arm to the base about an axis extending along the width;

a pair of lower drive means each extending between the base end and one of the lower arms for pivoting the lower arms on the base at the lower pivot means;

upper arm means comprising a pair of spaced-apart upper arms, each having a top end for carrying loads and a

bottom end opposite the top end, upper pivot means near the bottom end of each upper arm and on the top end of a lower arm for pivotally mounting each upper arm to a lower arm, the portion of each upper arm from the upper pivot means to the top end extending over the lower arm,

a pair of upper drive means each extending between an



upper and lower arm for pivoting the upper and lower arms relative to each other; and

a carriage and receiving means at the top of each upper arm for receiving the carriage between the upper arms, the carriage comprising a pair of shafts extending outwardly into the receiving means, the receiving means receiving the shafts for pivoting the carriage freely between the upper arms relative to the ground.

4,692,088

Patent Not Issued For This Number

4,692,089

ATTACHMENT FOR A BACK HOE BUCKET

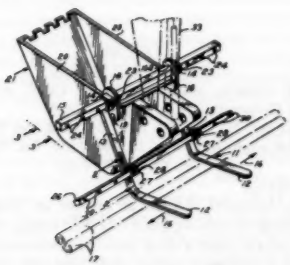
Charles E. Rodgers, 9007 Noroad, Jacksonville, Fla. 32210, and Herman R. Rodgers, P.O. Box 43, Ellerslie, Ga. 31807

Continuation-in-part of Ser. No. 587,054, Mar. 7, 1984, Pat. No. 4,560,318. This application Nov. 25, 1985, Ser. No. 801,200

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

Int. Cl.[4] B66F 9/12

U.S. Cl. 414—724 **22 Claims**



1. In an attachment for a back hoe bucket comprising a pair of elongated spaced support arms secured to and extending above respective side walls of a back hoe bucket adjacent a rear wall thereof, each of said arms having an opening therethrough adjacent its upper end in substantial alignment laterally of a back hoe bucket with each bottom wall forming said opening being generally flush with an upper edge of respective side wall of a back hoe bucket, an elongated upper bar extending laterally outwardly through said aligned openings in said arms and supported by said arms and adapted to be supported by an upper edge of respective side wall of a back hoe bucket, a pair of elongated generally upright members having lower ends and upper ends supported by said upper bar outboard of respective said arms, selective means releasably attaching said upper ends of said upright members in selected lateral positions on said upper bar, an elongated lower bar extending substantially parallel to said upper bar, and means to attach said lower bar to each of said upright members spacedly above said lower ends and generally below a back hoe bucket attachment to a boom of a back hoe vehicle to dispose said lower bar supportingly against a back wall of a back hoe bucket spaced adjacently above its bottom wall.

4,692,090

MULTISTAGE HYDRAULIC MACHINE

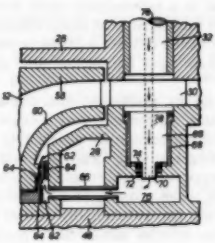
Shigekatsu Naka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 729,091, May 2, 1985, abandoned, which is a continuation of Ser. No. 357,147, Mar. 11, 1982, abandoned. This application Aug. 8, 1986, Ser. No. 893,464

Claims priority, application Japan, Mar. 23, 1981, 56-41890; Jan. 14, 1982, 57-3368

Int. Cl.[4] F04D 9/00, 29/14

U.S. Cl. 415—112 **2 Claims**



1. A dual purpose electricity generating and water pumping multistage hydraulic machine including coaxially and vertically arranged stages, the highest-pressure stage being uppermost, the machine comprising:

a rotatable shaft;

a plurality of runners mounted on said rotatable shaft, each of said runners being contained in an individual runner chamber to form a plurality of stages;

a stationary element associated with each of said runners;

a seal gap between each of said runners and its associated stationary element;

means for cooling said seal gap particularly when said machine is running dry, said means including:

water chamber means formed in said stationary element of said highest-pressure stage for retaining water, said water chamber means including a plurality of water chambers arranged around each of said plurality of runners associated with said highest-pressure stage and within said stationary element of said highest-pressure stage;

means for communicating water from said water chamber means to said seal gap of at least said highest-pressure stage;

means for supplying water to said water chamber means; and

movable guide vanes formed with upper and lower stems, said movable guide vanes being arranged in a circular

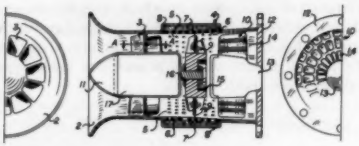
pattern around said runner of at least said highest-pressure stage, wherein said supplying means includes a supply passage in said movable guide vanes and the upper and lower stems.

4,692,091

LOW NOISE FAN

Paul E. Ritenour, P.O. Box 27318, San Diego, Calif. 92128

Filed Sep. 23, 1985, Ser. No. 779,059
Int. Cl.[4] F04D *29/66*
U.S. Cl. 415—119 **16 Claims**



1. A low noise axial flow fan assembly for suppling fluid to a fluid distribution system which comprises:

an external duct having fluid inlet and discharge means;

turning vane means within said duct adjacent to said inlet means for imparting a swirl velocity component to said fluid discharing from said turning vanes;

fan means spaced from said turning vane means for drawing said fluid through said inlet means and exiting said fluid out said exit means, said fan means having rotating blades configured to redirect said swirl velocity component of said fluid in a substantially axial direction through said discharge means; an axial vaned discharge means comprising short vaned diffuser sections position within said duct intermediate said fan means and said fluid discharge means;

acoustical means, positioned intermediate the discharge of said turning vane means and a place prior to said short vaned diffuser section for attenuating sound produced by fluid exiting said vane means and said rotating fan blades:

means to support and rotate said fan wherein said inlet turning vanes, when projected on a plane perpendicular to the axis of said fan, substantially covers the fluid flow area projection thereby substantially preventing sound from discharging from the space between said turning vane means and fan through said turning vane means, wherein said external duct inlet and diffuser sections consist of modular detachable segments, one segment enclosing said turning vanes, a second segment forming a sound cell, closely enclosing said fan tips and a third segment enclosing said short diffuser.

4,692,092

FUEL PUMP APPARATUS FOR INTERNAL COMBUSTION ENGINE

Takeshi Matsuda; Masasi Miyamoto, both of Kariya, and Toshihiro Takei, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 671,309, Nov. 14, 1984, abandoned. This application Dec. 23, 1986, Ser. No. 946,164
Claims priority, application Japan, Nov. 25, 1983, 58-220524; Apr. 16, 1984, 59-77275
Int. Cl.[4] F04D *9/00*
U.S. Cl. 415—143 **9 Claims**

1. A fuel pump to be positioned in a fuel tank of an internal combustion engine the fuel pump having a pump housing and an upright drive shaft, comprising:

(1) a first stage pump section including

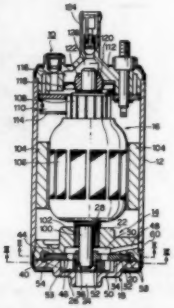
(a) a first pump passage formed in said pump housing and communicated at one end with an inlet port of said pump housing;

(b) a first impeller operatively connected to said shaft and operatively arranged in said first pump passage for separating, during rotation thereof, fuel vapor from liquid fuel, introduced from said inlet port, within said first pump passage and pressurizing said liquid fuel; and

(2) a second stage pump section including

(c) a second pump passage formed in said pump housing and communicated at one end to the other end of said first pump passage and at the other end to an outlet port of said pump;

(d) a second impeller operatively arranged in said second pump passage and operatively connected to said first impeller for further pressurizing the liquid fuel supplied from said first pump passage, said second impeller having a larger diameter than said first impeller, said second impeller being arranged at a vertically upper side of said first impeller;



(e) a vapor discharge port formed in said second impeller at a radially inward portion facing said first impeller and communicated at a vertically lower side thereof with the radial inward portion of said first pump passage for causing the fuel vapor separated on said first impeller to flow vertically and upwardly therethrough; and

(f) a vapor discharge passage formed upwardly and radially in said pump housing for communicating a vertically upper side of said vapor discharge port with the outside of said pump within the fuel tank, whereby the fuel vapor flowing out of said vapor discharge port is returned to a portion within the fuel tank vertically higher than said inlet port wherein said first impeller is of a centrifugal type, and said second impeller is of a regenerative type.

4,692,093

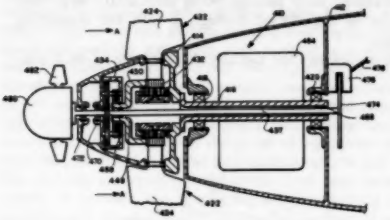
RAM AIR TURBINE

William F. Safarik, Manhatten Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 383,084, May 28, 1982, Pat. No. 4,578,019. This application Apr. 10, 1985, Ser. No. 721,736
Int. Cl.[4] F01D *7/02*
U.S. Cl. 416—1 **13 Claims**

1. In the operation of a ram air turbine, the method of pivotally adjusting the relative pitch of a fluid energy reactive blade member carried upon a rotor member comprising the steps of providing a reference speed shaft, coupling said reference speed shaft to said blade member via linkage means rotatable with said rotor member, and pivoting said blade member via said linkage means in response to a rotational speed difference between said reference speed shaft and said rotor member in a

sense to decrease said speed difference, including the step of selectively rotating said reference speed shaft at a chosen



speed, and the alternative step of using a brake apparatus to completely stop rotation of said reference speed shaft.

4,692,094

ROTARY POSITIONABLE INSTALLATION

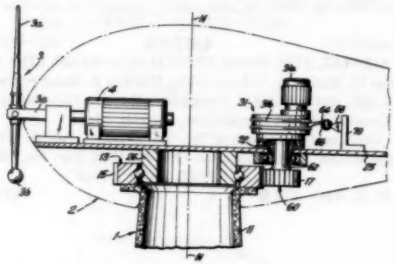
Ernst Kulinyak, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH

Continuation-in-part of Ser. No. 403,519, filed as PCT WE/81/00177 on Oct. 21, 1981, published as WO 82/01747 on May 27, 1982, abandoned. This application Jan. 31, 1986, Ser. No. 825,069

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043611

Int. Cl.⁴ F03D *11/04*

U.S. Cl. 416—11 **10 Claims**



1. A rotary positionable installation, such as a wind energy installation, including an upwardly extending tower (**1**) of considerable height having a vertical axis and an upper end, an apparatus carrier (**2**) supported on the upper end of said tower and being rotatable on the upper end about the vertical axis of said tower, and a drive (**31**) located on the upper end of said tower in operative engagement with said apparatus carrier and the upper end of said tower for positioning said apparatus carrier rotationally about the vertical axis of said tower, said tower with said apparatus carrier and said drive form a combination capable of oscillating around the vertical axis of the tower and having a natural yawing frequency, wherein the improvement comprises adjusting means (**18, 19, 27, 29, 33; 42, 44, 46, 48, 50; 66, 68, 74**) for variably adjusting the natural yaw frequency of the combination of said tower, apparatus carrier and drive, said adjusting means comprises at least one force transmission element (**28, 48, 66, 74**) positioned in said combination and connected to said drive and said apparatus carrier, and said at least one force transmission element has a variably adjustable spring stiffness means for adjusting the natural yawing frequency of the installation.

4,692,095

WIND TURBINE BLADES

Henry Lawson-Tancred, Boroughbridge, United Kingdom, assignor to Sir Henry Lawson-Tancred, Sons & Co. Ltd., Boroughbridge, United Kingdom

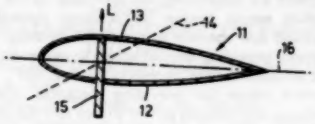
PCT No. PCT/GB85/00173, § 371 Date Dec. 12, 1985, § 102(e) Date Dec. 12, 1985, PCT Pub. No. WO85/04930, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 23, 1985, Ser. No. 816,127

Claims priority, application United Kingdom, Apr. 26, 1984, 8410669; Sep. 26, 1984, 8424339; Mar. 8, 1985, 8506060

Int. Cl.⁴ F03D *7/04*

U.S. Cl. 416—23 **27 Claims**



1. A wind turbine blade having an envelope which defines an airfoil profile having, in normal operation, a first, high pressure side, a second, low pressure side, and further having a leading edge and a trailing edge, which edges define an airfoil chord line extending between them, and comprising

a blade structure incorporating a fixed blade spar which extends outwardly on said first side from within the blade envelope and perpendicularly across said chord line to a position with respect to the blade cross-section which is external of the blade surface and spaced from said airfoil profile,

said blade spar comprising a strengthening member mounted along the length of the blade and disposed to disrupt air flow over the blade only in the event that the instantaneous wind direction is reversed so that said first side becomes the low pressure side.

4,692,096

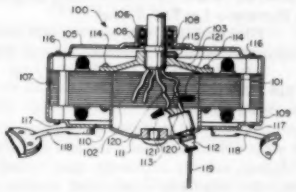
CEILING FAN

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Jul. 11, 1986, Ser. No. 884,594

Int. Cl.⁴ F04D *29/64*

U.S. Cl. 416—170 R **8 Claims**



1. A ceiling fan to be energized from an external alternating current power source, the ceiling fan consisting essentially of:

a motor housing;

an a.c. motor housed within said motor housing and having a stator which is stationary during operation of the fan, said stator having a longitudinal void formed therethrough, said motor further having a rotor annularly positioned about the stator, said rotor being rotationally moveable during the operation of the fan;

means for securing the motor housing to the rotor for rotational movement therewith;

a plurality of fan blades fixed to the motor motor housing, said blades being equidistantly positioned about the motor housing for rotational movement with said motor housing and said rotor;

a hollow suspension conduit having an upper portion to be

secured to a ceiling for suspension therefrom and a lower portion extending into said motor housing and secured to the stator within said motor housing, said suspension conduit being disposed through the motor housing and being journaled in bearings, wherein rotational movement of the motor housing about the conduit is facilitated;

a single piece switch housing and support positioned substantially directly below the void of the stator and including an inner surface and an aperture;

means within the motor housing for securing the switch housing and support to the stator;

an electrical on/off switch means positioned adjacent to the aperture on the inner surface of the switch housing and support for controlling the operation of the motor, said switch means having an actuator thereof extending through said aperture in the switch housing and support thereby providing manual access to said switch means via the actuator for the operation thereof; and

electrical cables for providing electrical communication between the external power source and the on/off switch means, said electrical cables being disposed through the suspension conduit and the void;

wherein said motor housing consists of an upper cover having a base provided with an aperture centrally formed therein receiving the suspension conduit therethrough and a bearing housing annularly positioned about said aperture in said upper cover, said upper cover further having a downwardly extending skirt portion fixed to periphery of said rotor and being contiguous with said base and a lower cover having a base provided with an aperture centrally formed therein in substantial alignment with the void, said aperture in said lower cover receiving the switch housing therethrough, said lower cover further having an upwardly extending side wall fixed to the periphery of said rotor and being contiguous with said base of said lower cover; and

wherein the switch housing consists of a base, an upwardly extending side wall contiguous with said base of said switch housing, and an outwardly extending rim annularly positioned about and contiguous with said side wall of said switch housing, said rim being fixed to said stator.

4,692,097

PROPELLER WITH REMOVABLE AND ADJUSTABLE BLADES

Bernard Bibollet, Cesson La Foret, France, assignor to Fonderie Musil, Dammarie Les Lys, France

Filed Jun. 25, 1986, Ser. No. 878,304

Claims priority, application France, Jun. 26, 1985, 85 10367

Int. Cl.[4] B63H *3/12;* **B64C** *11/06*

U.S. Cl. 416—207 **7 Claims**

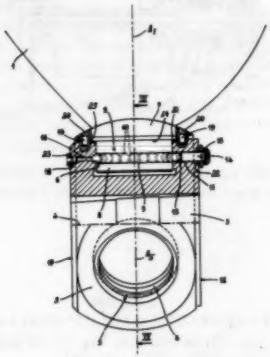
1. A propeller comprising:

a hub centered on and rotatable about a hub axis and formed with a bore extending along the axis and with a plurality of identical, radially outwardly open, substantially cylindrical, and angularly equispaced sockets centered on socket axes extending at least generally radially of the hub axis and formed with an annular groove open inwardly radially of the respective socket axis;

respective identical blades each having a substantially cylindrical base complementary to and snugly fittable in the respective socket coaxial with the respective socket axis and an outer part extending radially outward from the hub along the respective socket axis when the respective base is fitted therein, whereby the blades can turn about the respective socket axes on the hub, each base being formed with an annular but outwardly open groove confronting the respective inwardly open groove when the base is fitted in the respective socket and forming with the respective inwardly open groove an annular chamber, the hub being formed at each socket with a substantially radially extending loading passage having an outer outwardly open and threaded end and an inner end opening at the respective inwardly open groove; and lock means including:

a respective annular array of holding balls generally filling each chamber, each passage being sufficiently large that balls can be introduced through it into the respective chamber,

a respective locking ball radially displaceable in each passage and engageable between two of the holding balls of the respective array, and



means screwed into the outer end of each passage for pressing the locking ball radially between the respective two holding balls and for thereby releasably locking the bases in the respective sockets against relative movement between the respective blades and the hub and pressing the respective holding balls against the respective grooves.

4,692,098

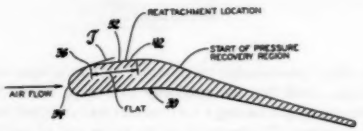
AIRFOIL FOR HIGH EFFICIENCY/HIGH LIFT FAN

Elias H. Razinsky, Toledo, Ohio; William B. Roberts, Fremont, Calif., and Richard E. Longhouse, Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 297,874, Aug. 31, 1981, abandoned. This application Oct. 15, 1985, Ser. No. 787,503

Int. Cl.[4] F04D *25/08, 29/68*

U.S. Cl. 416—223 R **13 Claims**



1. An airfoil defining the shape of the blades of an engine cooling fan of a land vehicle which optimally operates in a range of low Reynolds numbers and varying turbulence intensity conditions, said airfoil having a suction surface and a pressure extending from a leading edge to a trailing edge thereof, said suction surface being curved and having triggering means formed thereon closely adjacent to the leading edge of said airfoil to trigger establishment of a discrete laminar air flow separation bubble with a terminal end upstream of said trailing edge of said airfoil which effects the separation of laminar boundary air flowing onto said suction surface of said airfoil at a substantially constant and predetermined point forward of said bubble when operating in said range of low Reynolds numbers and varying turbulence intensity conditions and which provides for the reattachment of air circumventing said laminar separation bubble on said suction surface subse-

quent to passage over said bubble to thereby provide for high lift and low drag for high efficiency fan performance.

7. A method of improving the air pumping efficiency of a fan having a plurality of blades radiating from a centralized hub to terminal tip portions, each of said blades having a pressure surface and a suction surface leading rearwardly from a forward and radially extending nose portion to a terminal and radially extending edge portion defining an airfoil comprising the steps of designing a mathematical model of a cross section of said airfoil which provides optimized lift and reduced drag and which recognizes the existence of a laminar flow separation bubble and establishes the point of separation of laminar boundary air flowing across said suction surface and said bubble, plotting a section of said airfoil from said mathematical model to provide the shape thereof, establishing a surface discontinuity along a line on said suction surface of said airfoil which corresponds to said point of separation and in a region upstream of a zone on said suction surface in which boundary air naturally transits from a laminar to turbulent flow, tripping the laminar boundary air flowing across said suction surface with said discontinuity to physically establish a laminar flow separation bubble that terminates upstream of said terminal radial edge portion so that laminar boundary air flowing onto said suction surface will become detached adjacent to said discontinuity and flow over said bubble and back onto said suction surface downstream of said bubble in a pressure recovery region of said suction surface thereby providing inproved lift and reduced drag of said blades.

4,692,099

ROTARY COMPONENT OF A ROTARY DEVICE FOR HEAT ENGINES AND A METHOD OF MANUFACTURING THE SAME

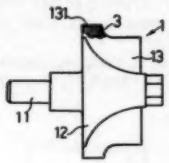
Takahiko Homma, Aichi, and Shigetaka Wada, Mie, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jun. 17, 1986, Ser. No. 875,195

Claims priority, application Japan, Jun. 18, 1985, 60-132779

Int. Cl.[4] F01D *5/34;* **C04B** *35/64*

U.S. Cl. 416—229 A **8 Claims**



1. In a rotary component of a rotary device for heat engines, formed in an integral ceramic-fiber-reinforced sintered ceramic structure comprising:

a shaft;

a hub; and

vanes radially extending from the circumference of the hub, the improvement wherein:

reinforcing ceramic fibers are distributed in an edge portion of each of the vanes, including side surfaces of each of the vanes, and are oriented substantially parallel to the side surfaces of each of the vanes and radially outward of each of the vanes.

7. A method of manufacturing a rotary component of a rotary device for heat engines, formed in an integral ceramic-fiber-reinforced sintered ceramic structure comprising a shaft, a hub, and vanes radially extending from the circumference of the hub, reinforcing ceramic fibers in the edges of the vanes being oriented substantially in parallel to the side surfaces of the vanes and radially outward of the vanes, which comprises the steps of:

preparing a mold having a cavity of a shape corresponding to that of the rotary component to be formed except that the depth of sections of the cavity corresponding to the vanes is greater than the height of the vanes to be formed;

injecting a fluidized mixture of a ceramic powder, ceramic fibers and an organic additive or additives into the cavity of the mold;

heating a molding thus molded to remove the organic additive or additives;

sintering the molding after the removal of the organic additive or additives to produce a sintered molding; and

cutting the outer extremities of the vanes to form the vanes in a predetermined height after said molding or said sintering.

4,692,100

VACUUM BLADE FOR A HOLLOW TYPE FAN AND PROCESS

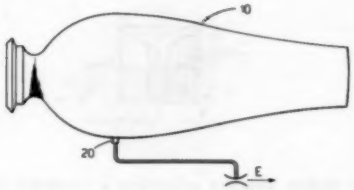
Massimiliano Nardella, Milan, Italy, assignor to F.B.M. Hudon Italiana S.p.A., Italy

Filed Feb. 27, 1985, Ser. No. 706,266

Claims priority, application Italy, Feb. 29, 1984, 19856 A/84

Int. Cl.[4] F04D *29/38*

U.S. Cl. 416—232 **3 Claims**



1. An improved propeller blade for an industrial fan, the blade having enhanced rigidity and reduced noise production during rotation comprising an airtight hollow shell in the configuration of a blade, the interior of substantially the entire shell defining an inner space, and the inner space being in a vacuum condition.

4,692,101

LIQUID RING VACUUM PUMP ARRANGEMENT HAVING MINIMIZED OPERATING LIQUID CONSUMPTION

Werner Fink, Bardowick, and Heinz Bohn, Rullstorf, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 11, 1985, Ser. No. 754,419

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425616

Int. Cl.[4] F04C *19/00;* **B01D** *19/00*

U.S. Cl. 417—68 **9 Claims**

1. An arrangement to minimize the consumption of cooling liquid in liquid ring vacuum pumps, said arrangement comprising:

a liquid ring vacuum pump;

a gas-liquid separator including a gas chamber portion;

an exhaust pipe leading from said pump to said separator;

an operating liquid pipe leading from said separator to said pump;

a cooling liquid pipe coupled to said pump to supply cooling liquid thereto;

a first pipe connecting said gas chamber with said operating liquid pipe and having means for adjusting gas flow to prevent cavitation;

a temperature sensor for measuring the temperature of cooling liquid exhausted from said pump; and

means for adjusting the amount of cooling liquid supplied to said pump in response to the temperature measured by said temperature sensor.

8. An arrangement to minimize the consumption of cooling liquid in liquid ring vacuum pumps, said arrangement comprising:

a liquid ring vacuum pump;

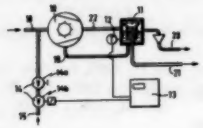
a two stage gas-liquid separator including a cyclone separator first stage and a potential vortex separator second stage;

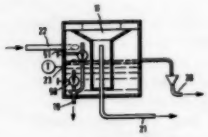
an exhaust pipe leading from said pump to said separator;

a cooling liquid pipe coupled to said pump to supply cooling liquid thereto;

a temperature sensor for measuring the temperature of cooling liquid exhausted from said pump; and

means for adjusting the amount of cooling liquid supplied to said pump in response to the temperature measured by said temperature sensor;





said cyclone separator comprising a cylindrical jacket, a cover part and a bottom part, a tangential pipe inlet on said jacket coupled to said exhaust pipe, a by-pass outlet on said cylindrical jacket for operating liquid, a separator exhaust pipe on said bottom part for exhausting operating liquid, a gas exhaust pipe extending through said bottom part for drawing off of gas, said pipe having its inlet located above said by-pass outlet; and

said potential vortex separator comprising a cylindrical case positioned coaxially within said cylindrical separator, said case having a bottom opening positioned below said by pass outlet and an upper opening connected with the interior of said cyclone separator by a plurality of sheet metal guides which extend essentially tangentially from the interior of said cyclone separator into the interior of said vortex separator.

4,692,102

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Walter Häfele, Fellbach, and Bernhard Schenk, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

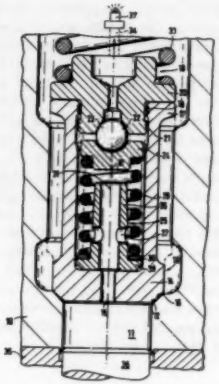
Filed Jul. 15, 1982, Ser. No. 398,513

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138211

Int. Cl.⁴ F04C *49/08*

U.S. Cl. 417—296 **2 Claims**

1. A fuel injection pump for internal combustion engines having a piston defining a work chamber, said pump further including a pressure valve inserted into a pressure line which leads from a pump work chamber to an injection valve, said pressure valve having a valve closing body guided in a carrier and said pressure valve arranged to open in a supply direction of the fuel counter to the force of a restoring spring, said valve closing body provided with a check valve having a movable closing member and a valve seat carrier, said seat carrier of said check valve having an outer flange and provided with an outer first set of threads being secured on said valve closing body provided with an inner second set of threads, and the closing member of said check valve arranged to open counter to the supply direction of the fuel via a spring supported on a base of said valve closing body, characterized in that for the purpose of axially securing said valve seat carrier on said valve closing body, said restoring spring simultaneously engages said valve seat carrier and presses said outer flange of said valve seat carrier against said valve closing body, and further that



both said sets of threads on said valve seat carrier and in said valve closing body cooperate only in a transit position, while in a functional position said first set of threads on said valve seat carrier are screwed all the way through said second set of threads in the valve closing body and are thus released from engagement with said first set of threads and juxtaposed therewith.

4,692,103

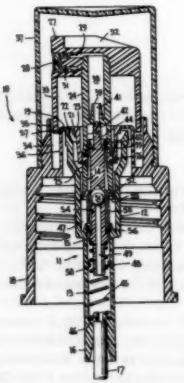
PRECISE OUTPUT PUMP SPRAYER

Walter F. Anderson, West Covina, Calif., assignor to Calmar, Inc., Watchung, N.J.

Filed Apr. 3, 1986, Ser. No. 847,453

Int. Cl.⁴ F04B *21/04, 39/10*

U.S. Cl. 417—547 **4 Claims**



1. A pump sprayer comprising, aligned first and second pistons of relatively large and small diameters respectively working in different diameter portions of a common pump chamber having one end thereof adapted for communication

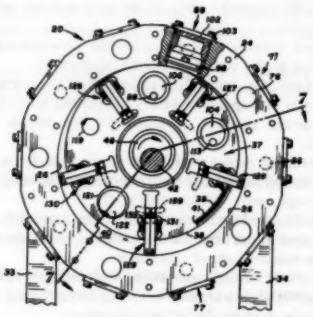
with a supply of liquid to be dispensed from a container through a dip tube connected to said one end, a valve controlled discharge passage extending through said first piston from said chamber, a valve controlled inlet passage extending into said chamber, a discharge valve seat in said discharge passage facing said pump chamber, said second piston having a discharge valve member engageable with said valve seat in a valve closed position, said discharge valve member being movable together with said second piston away from said valve seat toward said one end into a valve open position in response to a build-up of pressure within said chamber during pumping, means for reciprocating said pistons, a first limit stop on said valve member, a second limit stop on the wall of said discharge passage spaced from said valve seat a predetermined distance for limiting said movement of said valve member upon interengagement of said stops to thereby control the duration during which said discharge passage is open irrespective of different external reciprocating pressures applied during pumping, whereby the output of the sprayer is controlled during pumping.

4,692,104

ROTARY PUMPING APPARATUS WITH RADIAL SEAL ASSEMBLIES ON PISTON

Craig N. Hansen, Minnetonka, Minn., assignor to Hansen Engine Corporation, Minnetonka, Minn.

Filed Feb. 18, 1986, Ser. No. 830,335
Int. Cl.[4] F04C *18/344, 27/00, 29/00*
U.S. Cl. 418—61 R **38 Claims**



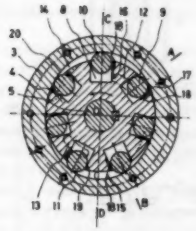
1. An apparatus for pumping a fluid comprising: housing means having an inner wall surrounding a chamber, means for controlling the flow of fluid into and out of said chamber, a piston means located within said chamber, eccentric means rotatably mounted on the housing means, said piston being rotatably mounted on the eccentric means whereby angular movement of the eccentric means moves the piston within the chamber, a plurality of seal assemblies movably mounted on said housing means, said seal assembly being located in sealing engagement with said inner wall of the housing means and arranged around said piston means to divide the chamber arcuate chamber segments, each seal assembly having blade means extended between the piston means and housing means, said piston means having generally radial movement relative to each seal assembly, each seal assembly and housing means having cooperating means for allowing limited arcuate movement of the seal assembly comprising a plurality of arcuate slots in said housing means open to the piston means and spaced radially inward of said inner wall, each slot having a radius that is substantially the same as the radius of the inner wall, each blade means having projection means extended into the aligned arcuate slots to restrict movement of the blade means and maintain the seal assembly in sealing engagement with said inner wall of the housing means during movement of the piston means in the chamber whereby said moving piston draws fluid into said chamber segments and pumps the fluid from said chamber segments.

4,692,105

ROLLER DISPLACEMENT MOTOR

André Leroy, 64 Chaussée de Binche, B 7030 Saint Symphorien, Belgium

Filed May 14, 1985, Ser. No. 733,807
Claims priority, application France, May 21, 1984, 84 08299
Int. Cl.[4] F03C *2/00*; F01C *1/00*; F04C *2/00*
U.S. Cl. 418—184 **7 Claims**



1. A roller-type positive displacement fluid machine including at least a motor unit capable of working reciprocally as a pump and a compressor, the motor unit comprising a housing formed by a cylindrical stator ring and first and second end plates, the stator ring having a cylindrical inner surface with a generally elliptical profile, a shaft rotatably supported within the housing for rotation about an axis, a cylindrical rotor fixed on the shaft within the housing, the rotor having a circular rotor profile and a plurality of slots disposed at equal angular intervals about the surface of the rotor, each slot being defined by a substantially planar leading face and a substantially planar trailing face, a cylindrical roller disposed in each slot, the rollers being sized to have a minimum clearance with respect to the slots so that they freely move radially within the slot for contact with the inner surface of the stator ring, the points of contact between the roller and the leading face over one complete revolution of the rotor describing a geometrical locus of points which define an imaginary closed curve, and the space defined by two consecutive rollers, the rotor surface, and the inner surface of the stator ring constituting a working fluid chamber, the trailing face of each slot having an open channel therein connecting the portion of the slot beneath the roller with the surface of the rotor and the working chamber, and fluid inlet ports and outlet ports disposed within said housing, the inlet ports being entirely located at a radius less than the radius of said imaginary curve formed by said geometrical locus of points and such that the inlet ports may be opened and closed by the leading and trailing faces, respectively, of said slots, and said outlet ports being entirely located at a radius greater than the radius of said imaginary curve formed by said geometrical locus of points and such that the outlet ports are opened and closed by said rollers contacting the inner surface of the stator ring, and wherein the outlet ports are angularly located such that they are opened at substantially the position of a roller at which the roller has reached its maximum radial stroke and will start an inward stroke, and the inlet ports being angularly located such that they are closed by the trailing face of each slot.

4,692,106

APPARATUS FOR STRETCHING THE INDIVIDUAL STRANDS OF A BUNDLE OF FIBERS OR THREADS

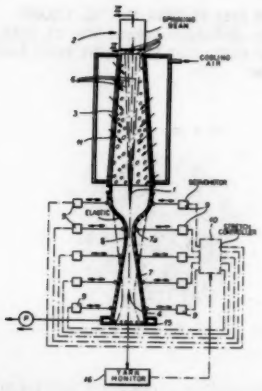
Robert Grabowski, Troisdorf, and Walter Krümer, Bonn, both of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,622

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1985, 3503818

Int. Cl.[4] D01D 5/12

U.S. Cl. 425—66 7 Claims



1. An apparatus for spinning and stretching a multiplicity of monofilaments, comprising:

a spinning bar formed with a plurality of spinning orifices from which individual monofilaments emerge;

means adjacent said spinning bar forming an elongated blowing compartment receiving said individual monofilaments, said blowing compartment being formed with a plurality of blowing nozzles training jets of stretching and cooling air upon said monofilaments, said blowing compartment having an outlet at which said monofilaments and an air stream formed in said compartment emerge;

flexible wall means forming an elongated stretching chamber connected to said outlet and completely and directly surrounding a bundle formed by all of the monofilaments traversing said stretching chamber, said stretching chamber having the configuration of a venturi nozzle having an annular converging portion proximal to said outlet merging continuously and smoothly into an annular constriction and then continuously and smoothly into an annular diverging portion in a direction of movement of said bundle and said air stream through said stretching chamber;

a multiplicity of motor-driven adjusting mechanisms, each including a control motor, positioned along said flexible wall means and spaced apart in said direction for varying the shape of said venturi nozzle; and

control means connected with said motors for selectively operating same to select said shape.

4,692,107

APPARATUS FOR CONTINUOUSLY PRODUCING AT A FLOW RATE A STRIP OF DOUGH OF CONSTANT DIMENSIONS

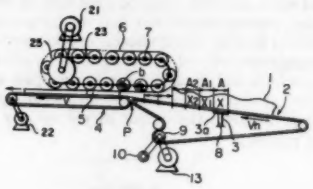
Michio Morikawa, and Torahiko Hayashi, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Japan

Filed Mar. 11, 1986, Ser. No. 838,338

Claims priority, application Japan, Mar. 12, 1985, 60-49108

Int. Cl.[4] C01G 1/00

U.S. Cl. 425—140 3 Claims



1. An apparatus for continuously producing at a constant flow rate of a strip of daugh of constant dimensions comprising:

a variable speed conveyor for feeding dough,

a dough weighing device continuously measuring the weight of each portion of the dough conveyed past the weighing device, the weighing device being located between the opposite ends of the conveyance path of the conveyor,

a constant speed conveyor arranged downstream of and adjacent to the variable speed conveyor,

a control unit for controlling the speed of the variable speed conveyor at a speed inversely proportional to the weight of a dough portion measured by the dough weighing device,

dough defining means positioned on the conveyance path of the constant speed conveyor to define the outer sides of the dough, and

dough holding means including a roller mechanism to hold the dough at portions on the variable speed conveyor and on the constant speed conveyor,

said roller mechanism comprising a plurality of rollers rotatable about their axes and movable along a path including a straight portion above the conveyors,

the straight portion of the roller path being positioned over both the variable speed conveyor and the constant speed conveyor, thereby holding the dough fed between the roller mechanism and the conveyors to produce the strip of dough of constant dimensions.

4,692,108

MOLD FOR THE COVERING AND TRIMMING OF PRODUCTS OF PLASTICS MATERIAL

Franco Cesano, S. Secondo di Pinerolo, Italy, assignor to G.O.R. Applicazioni Speciali S.p.A., Turin, Italy

Filed Mar. 21, 1986, Ser. No. 842,250

Claims priority, application Italy, Jul. 31, 1985, 12550 A/85

Int. Cl.[4] B29C 51/32

U.S. Cl. 425—292 5 Claims

1. A molding apparatus for the production of a shaped laminate having a thermoplastic substrate and a covering material of a flexible sheet material adhering on said substrate, said apparatus comprising:

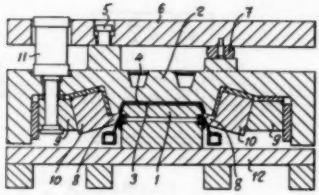
a male mold member and a female mold member;

each of said mold members having a molding surface and a perimeter corresponding to the desired outline of the substrate;

said mold members being movable in a reciprocating manner relative to each other between a first position wherein the

mold members are spaced apart and a second position wherein said molding surfaces are near each other and define a mold substantially corresponding to said shaped laminate;

at least three trimming knives, each of said trimming knives, having a cutting edge located adjacent the perimeter of said male member, said trimming knives being movable substantially transversely to said male member and being adapted to cut both the substrate and the covering material along pre-established edges when said male and female members are in said second position;



said trimming knives including at least two rectilinear side knives associated with rectilinear sides of the perimeter of said male member and at least one shaped knife having a cutting edge corresponding to curved or corner sections of the perimeter of said male member;

said side knives each having planar tapered end extensions and said shaped knife having end portions being slidably engageable with said extensions as said trimming knives are moved substantially transversely to said male member; and

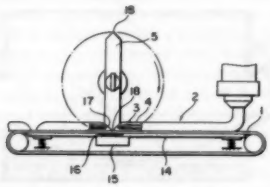
means for simultaneously moving said side knives and said shaped knife substantially transversely to said male member.

4,692,109

APPARATUS FOR CUTTING FILLED CYLINDRICAL DOUGH BODY

Torahiko Hayashi, and Yasunori Tashiro, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Japan

Filed Oct. 15, 1985, Ser. No. 787,619
Claims priority, application Japan, Oct. 13, 1984, 59-215006
Int. Cl.⁴ A21C *11/12*
U.S. Cl. 425—308 **4 Claims**



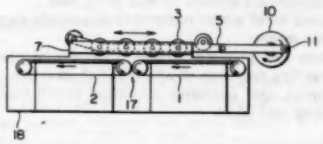
1. An apparatus for cutting a filled cylindrical dough body into pieces without exposing the filler, comprising a conveyor belt and at least one cutter member, arranged above and perpendicularly to the conveyance path of the conveyor belt and provided with a blade having means including a wedge shape of sufficient width for closing the dough over the filler when the blade cuts through the dough body, means for moving said blade to progress in synchronization with the conveyor belt as the blade cuts through the dough body and for lowering the blade into cutting contact with the dough body and then raising it, and means for repeatedly reciprocating it from side to side perpendicularly to the conveyance path as it is lowered.

4,692,110

APPARATUS FOR STRETCHING PLASTIC DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Filed Sep. 3, 1985, Ser. No. 771,887
Claims priority, application Japan, Aug. 31, 1984, 59-183405
Int. Cl.⁴ A21C *3/02*
U.S. Cl. 425—335 **4 Claims**



1. An apparatus to stretch plastic dough, comprising:

a plurality of serially disposed conveyors operable at different speeds;

a plurality of rollers above the conveyors, the rollers being freely rotatable about their axes and driven together in linear reciprocation only back and forth along the conveyance path of the conveyors, the lower portion of the rollers forming a straight portion spaced apart from and above the conveyors by a selected distance for the desired thickness of the dough;

means for driving said plurality of conveyors in the same direction with a conveyor downstream in said direction being driven at a faster speed than a conveyor upstream of said direction in order to provide a stretching action to said plastic material; and

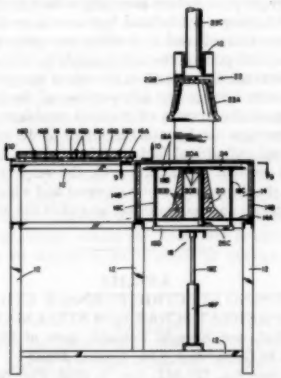
means for driving said plurality of rollers together in linear reciprocation only back and forth above the conveyance path.

4,692,111

APPARATUS FOR FORMING PLASTIC ARTICLES

Curtis D. Wagner, P.O. Box 55753, Houston, Tex. 77255

Division of Ser. No. 595,560, Mar. 30, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 749,734
Int. Cl.⁴ B29C *51/00, 51/42*
U.S. Cl. 425—388 **6 Claims**



1. Apparatus for thermoforming a plastic sheet into an article, comprising:

a first mold means;

platten assembly means for disposing said sheet adjacent said first mold including

means for providing relative motion between said platten assembly and said mold; and

a platform disposable about said mold;

heating means for heating said sheet in an amount sufficient to cause at least a portion of said sheet to conform to said mold; wherein

said means for providing relative motion moves said platform between locations generally upwards of and downward relative to said mold; and

a second mold means removably disposable about said first mold means;

wherein said platform defines a pattern of plural radially extending apertures at which said sheet is free of subjacent support, said apertures providing droop locations for a heated said sheet.

4,692,112

MULTI-PURPOSE LIGHTER ASSEMBLY

Cheng-Ming Chen, No. 5-1, Te-Hui Street, Taipei, Taiwan

Filed Sep. 8, 1986, Ser. No. 904,863

Int. Cl.[4] F23Q *2/32*

U.S. Cl. 431—253 **1 Claim**

1. A multi-purpose lighter assembly which is characterized by a lighter having a cylindrical fuel container disposed on a right portion thereof and a writing instrument detachably mounted on a left portion thereof in a side by side relationship, a circular protrusion disposed on the top of said writing instrument, a counter-bore in the left portion of the lighter and a counter-bore in the bottom of the fuel container, so that the writing instrument can be attached either to the left portion or under the said cylindrical fuel container of the lighter by engaging said circular protrusion with the respective counter-bore, and a shoehorn with a clip element and a bottom portion so shaped that it can accommodate an end of the writing instrument.

4,692,113

SYSTEM USING ELECTRIC FURNACE EXHAUST GAS TO PREHEAT SCRAP FOR STEELMAKING

Kiyoshi Takai, and Kiyoshi Iwasaki, both of Hyogo, Japan, assignors to Godo Steel, Ltd., Osaka, Japan

Division of Ser. No. 721,461, Apr. 9, 1985, Pat. No. 4,619,693. This application Sep. 10, 1986, Ser. No. 906,120

Claims priority, application Japan, Jul. 23, 1984, 59-152300

Int. Cl.[4] C21B *3/04*; F23J *15/00*

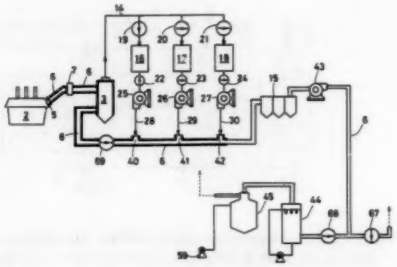
U.S. Cl. 432—72 **4 Claims**

1. A method for clean preheating of scrap contaminated with oil and organic matter, for steelmaking, using heat from exhaust gas flow from an electric furnace, comprising the steps of:

burning any combustibles present in said exhaust gas flow and simultaneously separating out dust particles from said exhaust gas flow;

heating a predetermined amount of said scrap by heat exchange with a predetermined portion of said exhaust gas flow;

removing and collecting dust from said exhaust gas flow after preheating of scrap thereby;



sensing the temperature of said exhaust flow;

scrubbing said exhaust gas flow with an aqueous solution of a deodorant solvent flowing at a rate regulated to be in a predetermined relationship related to said exhaust gas temperature sensed prior to scrubbing, thereby generating saturated vapor and reducing the temperature of said exhaust gas flow by a predetermined amount; and

electrostatically precipitating out oil mist attached to saturated water vapor and liquid droplets in said exhaust gas flow.

4,692,114

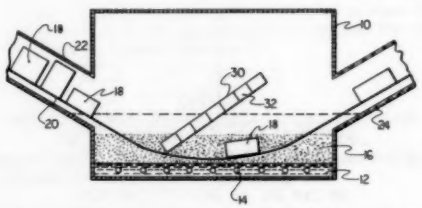
VAPOR LEVEL CONTROL FOR VAPOR PROCESSING SYSTEM

Gerald E. Waldron, Foxboro, and Edward J. Wilson, Wilmington, both of Mass., assignors to Dynapert-HTC Corp., Farmington, Conn.

Filed Mar. 26, 1986, Ser. No. 844,396

Int. Cl.[4] F23D *5/00*

U.S. Cl. 432—198 **5 Claims**



1. A vapor processing system comprising:

a vessel for containing a processing vapor,

heater means for heating an electronic liquid contained within said vessel to establish a saturated vapor zone, said heater means having a variable output,

means for conveying work product to the saturated vapor zone,

means for defining a selected saturated vapor zone level for work product delivered to the vapor zone including

means for generating a signal representative of the actual temperature at one of at least a plurality of spaced locations within said vessel,

means for generating a signal representative of the desired temperature at the selected vertical location for a saturated vapor zone having a level selected for the work product being conveyed to the saturated vapor zone, and

means for comparing the signals representative of the actual and desired temperatures at the selected vertical location and for varying the output of said heater means to change the actual sensed temperature to the desired temperature so that the actual saturated vapor zone level will conform to the desired saturated vapor zone level.

4,692,115

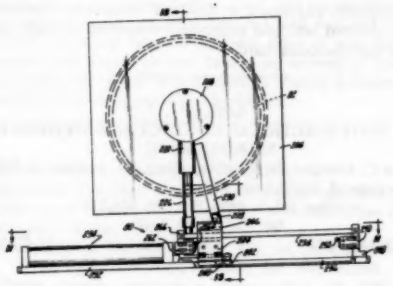
SEMICONDUCTOR WAFER FURNACE DOOR

Robert E. Aldridge, Anaheim; Russell Elloway, Riverside; William O. Fritz, Anaheim; Ralph D. Goff, and Michael J. Herrera, both of Placentia, all of Calif., assignors to Thermco Systems, Inc., Orange, Calif.

Division of Ser. No. 719,409, Apr. 3, 1985, Pat. No. 4,636,140. This application Jun. 30, 1986, Ser. No. 880,422

Int. Cl.[4] F27D *1/18*

U.S. Cl. 432—242 **8 Claims**



1. In apparatus for treating semiconductor wafers or the like which are carried by a boat, and of the type including the combination of a furnace having a processing tube provided with an opening in one end thereof and a loader adjacent said tube for loading boats into and unloading boats from said tube, said loader being movable along the axis of the tube and passing through said tube opening, the improvement comprising:

a door for engaging and sealing one end of said tube; and,

control means for moving said door along first and second axes between a closed position sealing said one end of said tube and an open position spaced from said end of said tube, said control means including a mechanism for guiding said door along said first and second axes, said mechanism including

first and second elongate guides respectively extending parallel and transverse to said tube axis,

a guide block slidable on said second guide, said door being carried by said guide block,

a carriage slideably mounted in said first guide,

a motor having a drive member transversely shiftable relative to the tube axis, and

means for interconnecting said slide block and said carriage with said drive member.

4,692,116

DENTAL PIN AND HOLDER

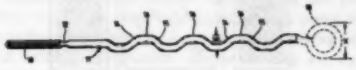
Stuart J. Filhol, Castlefreke, County Cork, Ireland

Filed Oct. 16, 1985, Ser. No. 787,981

Claims priority, application United Kingdom, Oct. 16, 1984, 8426117; Jan. 5, 1985, 8500283

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—225 **14 Claims**



1. A dental pin comprises an elongate threaded pin portion for insertion into a tooth and a shank releasably connected to the threaded portion, wherein the shank includes at least two shank portions whose axes are inclined at an acute angle to the axis of the threaded portion and the two shank portions are inclined in opposite directions to one another.

4,692,117

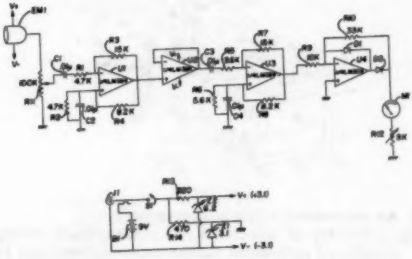
ACOUSTIC ENERGY, REAL-TIME SPECTRUM ANALYZER

Allen W. Goodwin, 3051 Kirklevington, #102, Lexington, Ky. 40502

Continuation-in-part of Ser. No. 404,708, Aug. 3, 1982, abandoned. This application Jan. 8, 1984, Ser. No. 689,718

Int. Cl.[4] G09B *15/00, 19/04*

U.S. Cl. 434—185 **1 Claim**



1. A real-time spectrum analyzer for monitoring and visually displaying acoustic energy solely in the range of singer's formant, comprising means for converting said energy to an electrical signal, filtering means having a non-adjustable bandwidth extending from about 2500 to about 3500 Hz and a non-adjustable passband shape consisting of essentially no attenuation throughout the 2500–3500 Hz passband and attenuation at a rate of at least 18 db per octave outside the passband, said filtering means comprising two band-pass filters, one tuned to about 2750 Hz center frequency and the other to about 3,200 Hz center frequency, and unidimensional real-time display means for displaying visually the magnitude of the total amplitude of energy within the fixed said passband while not responding or adjusting to respond to energy outside said passband.

4,692,118

VIDEO SUBCONSCIOUS DISPLAY ATTACHMENT

Richard E. Mould, 291 Gardendale Rd., Encinitas, Calif. 92024

Filed Jan. 28, 1986, Ser. No. 823,456

Int. Cl.[4] G09B *19/00*

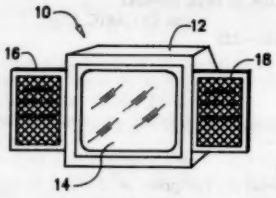
U.S. Cl. 434—236 **17 Claims**

1. An apparatus for the introduction of messages to the subconscious mind, comprising:

panel means defining a generally flat planar surface for

supporting a desired message in a selcted position in the peripheral vision of an observer;

said panel means is designed to be positioned adjacent a television screen during normal viewing thereof;



a message graphically depicted on said panel means; and,

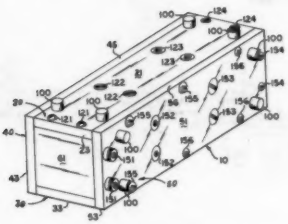
means for partially masking said message in a manner for subconscious awareness without said message interfering with conscious thought.

4,692,119

EDUCATIONAL PUZZLE BOX

Hoyt D. Ussery, 5 Elmwood Pl., St. Charles, Mo. 63301

Continuation of Ser. No. 746,967, Jun. 20, 1985, abandoned.
This application Nov. 18, 1986, Ser. No. 933,317
Int. Cl.[4] G09B *19/24*; A63F *9/08*
U.S. Cl. 434—259 **6 Claims**



1. An educational puzzle box comprising:

(a) a plurality of non-coded side portions each having a plurality of unthreaded fastener-receiving openings having at least two different dimensions,

(b) a plurality of non-coded cross-members disposed in perpendicular relation to said side portions, each cross member having a plurality of threaded openings associated with the unthreaded openings of the side portions,

(c) a plurality of threaded fastener elements selectively receivable by associated openings of the side portions and the cross members for connecting said side portions and cross members together when said side portions and cross members are properly oriented, at least two fastener elements having different dimensions compatible with the dimensions of the associated openings, and

(d) the threaded and unthreaded openings being alignable to receive compatible fastener elements but the compatibility of all of said openings and fasteners not being immediately apparent so that the assembly of the box presents a puzzle.

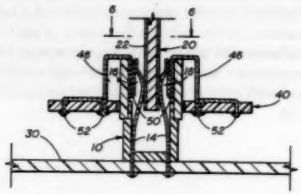
4,692,120

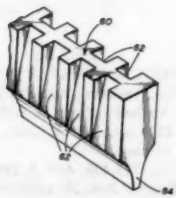
ELECTRONIC CARD FOR SHARING THE SAME EDGEBOARD CONNECTOR WITH ANOTHER ELECTRONIC EDGEBOARD

David Y. Feinstein, 7722 Fawn Ter., Houston, Tex. 77071

Filed Oct. 1, 1986, Ser. No. 914,452
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—62 **15 Claims**

1. An electronic card for sharing the same edgeboard connector with an electronic edgeboard that is to be inserted into the edgeboard connector, wherein said electronic card has a hole with a shape and dimensions matching the outer surface of said edge connector, and wherein said electronic card is further equipped with a plurality of contact means for electrically connecting the various circuits of said electronic card with the





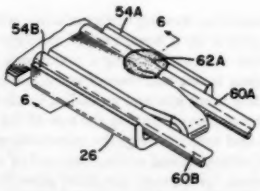
contacts of said edgeboard connector, said electronic card is mechanically supported by said contact means around said edgeboard connector in a plane perpendicular to the plane of said electronic edgeboard so that said electronic edgeboard can be inserted into said edgeboard connector through said hole of said electronic card.

4,692,121

DUAL SLOT ELECTRICAL CONTACT AND METHOD OF MAKING SAME

William C. Arbogast, Jr., Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 3, 1986, Ser. No. 882,126
Int. Cl.[4] H01R *4/02*
U.S. Cl. 439—874 **12 Claims**



1. An electrical connection of a contact terminal and two conductor wires, comprising:

two conductor wires having selected diameters and being exposed for terminating; and

a contact terminal including a termination section having a spaced pair of conductor-receiving slots extending forwardly from a rearward end thereof, said slots defined by a central portion of said termination section bent back from a rearward end thereof having a selected width and parallel, vertical side edge surfaces, and parallel side walls of said termination section bent vertically upwardly from side portions thereof and spaced from respective said side edge surfaces of said central portion a selected distance at

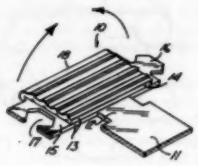
at least one axial location defining a slot width thereat selected to be just less than the diameter of a respective said conductor wire to hold a said wire in interference fit therein and terminated thereto by a weld joint.

4,692,122

ELECTRICAL TERMINAL

Peter Montalbano, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 6, 1986, Ser. No. 915,416
Int. Cl.[4] H01R 4/18
U.S. Cl. 439—882 11 Claims



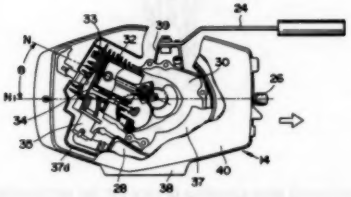
1. An electrical interconnection terminal having a connector portion usable for being in contact with other objects, and having a tubular portion with a wall means surrounding a passageway in which an extended interconnection member can be accepted and secured by said wall means being crimped thereagainst, said wall means having a first portion of a sheet of material folded toward said connection portion and against a second portion of said sheet of material such that said first portion forms an interior surface about said passageway with that junction region resulting between said first and second portions extending between opposite sides of said sheet of material, said second portion having an opening at one said side thereof in which is positioned a mating protuberance extending from said opposite side thereof.

4,692,123

OUTBOARD MOTOR

Yukio Tada; Hiroshi Umeno; Yasuhiro Sugimoto, and Hideo Oka, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 639,295, Aug. 10, 1984, abandoned.
This application Nov. 17, 1986, Ser. No. 931,881
Claims priority, application Japan, Aug. 10, 1983, 58-146979[U]; Aug. 23, 1983, 58-129301[U]; Dec. 3, 1983, 58-187176[U]; Mar. 1, 1984, 59-29679[U]
Int. Cl.[4] B63H 21/26
U.S. Cl. 440—77 23 Claims



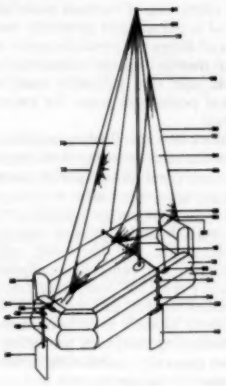
1. An outboard engine comprising:
(a) a power unit;
(b) an extension case extending vertically and having the upper end thereof coupled to said power unit;
(c) a propeller mounted on the lower end of said extension case and driven by said power unit;
(d) a handlebar mounted on said power unit;
(e) said power unit comprising:
an internal combustion engine; and
a cover assembly covering said internal combustion engine;
(f) said cover assembly having a foot on one side thereof to form a base for laying down the outboard engine;
(g) said internal combustion engine having a generally vertically extending crankshaft and a cylinder having an axis generally horizontal and perpendicular with respect to said crankshaft and the axis of said cylinder being inclined to another side with respect to the axis of said propeller when viewed in plan, said cylinder axis being inclined away from the side of the cover assembly having said foot, said internal combustion engine having no cylinders which are not inclined to said another side with respect to the axis of said propeller; and
(h) said handlebar being disposed on a side of said power unit toward which the axis of said cylinder is inclined.

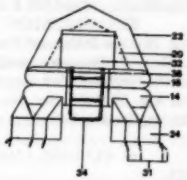
4,692,124

SAIL RAFT - CONVERTIBLE INFLATABLE LIFE RAFT

Terry Harper, Box 731, Venice, Calif. 90294

Filed Oct. 17, 1985, Ser. No. 788,418
Int. Cl.[4] B63C 9/02, 9/04
U.S. Cl. 441—40 1 Claim



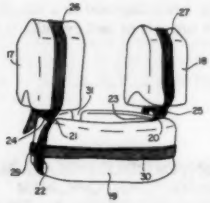


1. A life raft comprising: an inflatable hull; a mast; means for removably supporting the mast in the hull; at least one sail supported by said mast; a tiller/rudder assembly; and means for removably mounting the tiller/rudder assembly to the hull; a lee board/weather jack assembly; and means for removably mounting the lee board/weather jack to the hull, which includes at least one self-filling water ballast bag retractably secured to the side of the hull so the bag can be retracted for sailing and movement of the boat or lowered for stabilizing the boat.

4,692,125
SWIMMING AND BATHING AID

Börje Wessman, Korsuddsvägen 19, Saltsjö-Boo S-13200, Sweden

PCT No. PCT/EP83/00248, § 371 Date Jun. 27, 1984, § 102(e) Date Jun. 27, 1984, PCT Pub. No. WO84/01757, PCT Pub. Date May 10, 1984
Continuation of Ser. No. 626,832, Jun. 27, 1984, abandoned.
This PCT application Sep. 23, 1983, Ser. No. 898,861
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239924
Int. Cl.[4] A63B *31/00*
U.S. Cl. 441—112 18 Claims



18. A swimming and bathing aid for a person, comprising:

a generally annular chest ring of buoyant material disposed about the chest of a person and generally beneath the person's armpits and above the person's center of gravity, and defining a gap therein disposed substantially adjacent the person's back, said ring generally maintaining the person in a vertical position in water for swimming and bathing therein; and

a pair of generally block-like arm floating members of buoyant material secured to said chest ring with respective first strips which also surround the respective arm floating members and the person's upper arms so that such members are disposed above the person's upper arms, respectively, in contact with the outer sides of same for following movement therewith, said block-like arm floating members being adapted for generally conforming to the shape of the person's arms for contacting same with defined contact surfaces thereof, and for providing increasing buoyancy thereto as such arms progressively enter water, and such increasing buoyancy providing a force to the person for also generally maintaining same in a vertical position in water for swimming and bathing therein.

4,692,126
CLAW COUPLING ASSEMBLY FOR TORQUE TRANSMISSION

Klaus Ehrlenspiel; Thomas John, and Wolfgang Streinz, all of Munich, Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Apr. 29, 1985, Ser. No. 728,320
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415908
Int. Cl.[4] F16D *3/16*
U.S. Cl. 464—103 7 Claims

1. A claw coupling assembly for transmitting torque between two shafts, comprising:

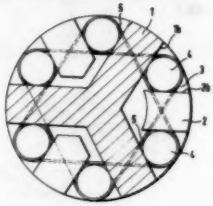
a driving member and a power takeoff member;

a plurality of claws on said driving member and an equal number of claws on said power takeoff member, said claws having lateral surfaces which define therebetween spaces which narrow radially;

movable transmission members interposed between said claws on said driving member and said claws on said power takeoff member within said spaces;

traction means engaging said transmission members on sides thereof remote from the narrowed portions of said spaces, said traction means comprising two flexible endless traction members, one of said traction members being guided around said transmission members and contacting said claws on said driving member in one rotational direction and the other of said traction members being guided around said transmission members contacting said claws in the other rotational direction;

said lateral surfaces on said claws on said driving member and on said power takeoff member comprising in axially central areas thereof a lateral surface projecting in one

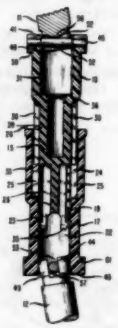


rotational direction and being formed in axial border areas on both sides of said central areas with lateral surfaces projecting in another respective rotational direction, wherein said transmission members in said spaces with said projecting lateral surfaces and in said central area and in the border areas also have projecting support surfaces in said central area and in said border areas respectively and wherein said traction means are guided around said surfaces which are recessed relative to said support surfaces.

4,692,127
DEVICE FOR A FORCE TRANSMITTING CONNECTION BETWEEN TWO SHAFTS

Alois Wagner, Olching, Fed. Rep. of Germany, assignor to Hasler AG Bern, Bern, Switzerland

Filed Oct. 28, 1985, Ser. No. 792,038
Int. Cl.[4] F16D *3/16, 3/06*
U.S. Cl. 464—119 8 Claims



1. A universal joint coupling device for the accomodation of misalignment comprising

a drive shaft have a ball-shaped joint head rigidly attached thereto at one end thereof;

a driven shaft having a ball-shaped joint head rigidly attached thereto at one end thereof;

each ball-shaped joint head having a dog driver slot extending radially therethrough and formed as a groove open to the outer end of said ball-shaped joint head, the bootom of each said groove having a centered protrusion;

an intermediate shaft disposed between said drive and driven shafts, said intermediate shaft comprising an outer tubular part having first and second ends and an inner part having first and second ends, said inner part first end being telescopically received in torque transmitting engagement in said outer tubular part first end, each of said outer tubular part and said inner part having an axial cylindrical bore at said second end, respectively receiving one of said ball-shaped joint heads of said drive and driven shafts; and

a first dog driver bolt anchored to said second end of said outer tubular part; and

a second dog driver bolt anchored to said second end of said inner part, said first dog driver bolt having a length which corresponds to the outer diameter of said outer tubular part and said second dog driver bolt having a length which corresponds to the outer diameter of said inner part, each dog driver bolt having a thickened middle region received in each said dog driver slot which corresponds in length to the respective diameter of said axial cylindrical bores;

said outer tubular part including a radially inwardly extending collar section intermediate the ends thereof;

said inner part including an extension axially extending from said inner part first end and terminating in barbed spring support levers which are snapped past said collar section and limit axial separation of said outer tubular part and said inner part;

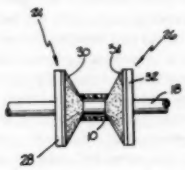
said intermediate shaft further including a helical spring interposed between said collar section and said inner part first end to bias said outer tubular part and said inner part in opposite directions to thereby bring the dog driver bolts into continuous close engagement with said centered protrusions.

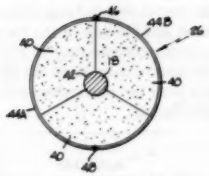
4,692,128

CONTINUOUSLY VARIABLE TRANSMISSION PULLEY

Thomas H. Sadler, Highlands Ranch, Colo., assignor to Manville Corporation, Denver, Colo.

Filed Jun. 25, 1986, Ser. No. 878,547
Int. Cl.[4] F16H *55/52*
U.S. Cl. 474—8 **9 Claims**





1. In a power transmission arrangment having a drive shaft, a pulley mounted on the drive shaft, a driven shaft, a pulley mounted on the driven shaft, and a drive belt trained over and operatively connecting the pulleys, the improvement comprising:

each pulley having a base portion and a belt engaging face portion;

each belt engaging face portion comprising a plurality of connecting segments, having wear surfaces which together are forming a conical surface,

the wear surfaces of said segments being comprised of a composition including friction modifying material which will erode to a greater extent than the belt as a result of its operative contact with the belt; and

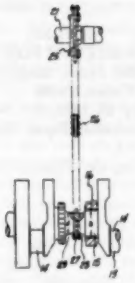
means for removable attaching the face portions of the puleys to the base portions thereof.

4,692,129

TIMING CHAIN DRIVE

Wataru Fuchigami, Iwata, and Yoshiharu Nakayama, Hamamatsu, both of Japan, assignors to Yamaha Motor Co., Ltd., Japan

Continuation of Ser. No. 753,643, Jul. 10, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 5,320
Claims priority, application Japan, Jul. 27, 1984, 59-155469
Int. Cl.[4] F16H *7/06*
U.S. Cl. 474—148 **1 Claim**



1. A timing drive for driving an overhead mounted camshaft from the crankshaft of an internal combustion engine, said crankshaft having at least one main bearing surface fromed therein for journaling said crankshaft for rotation and a sprocket adjacent said main bearing surface for driving the camshaft, said sprocket having its dedendum diameter smaller than the diameter of said main bearing surface, said crankshaft having a plurality of throws and said sprocket being formed between an adjacent pair of the throws, said dedendum diameter being substantially the same as the diameter of the adjacent portions of said crankshaft.

4,692,130

LOAD BLOCK FOR CHAIN-BELT

Gary J. Novak, Villa Park, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 719,401, Apr. 3, 1985, abandoned. This application May 6, 1986, Ser. No. 860,379
Int. Cl.[4] F16G *5/18*
U.S. Cl. 474—201 **2 Claims**

1. A load block for an endless chain-belt for a pulley transmission having at least two pulleys, which chain-belt comprises:

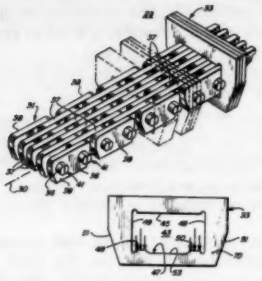
a carrier including a plurality of links arranged in alternating sets, said sets of links interlaced and joined by pivot means;

a plurality of load blocks, at least one of said load blocks positioned on said carrier between adjacent pivot means;

each of said load blocks defining a single window to receive said carrier therethrough, which window includes a bottom surface, a top surface and two mirrored side surfaces defining said window;

wherein the improvement comprises a pair of coplanar load bearing surfaces adjacent the side surfaces separated by a

central relief segment therebetween below the plane of said load bearing surfaces forming said window bottom



surface, which load bearing surfaces provide the sole means of stress support in the window of said load blocks.

4,692,131

REAR DERAILLEUR FOR A BICYCLE

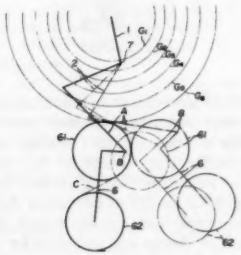
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 14, 1986, Ser. No. 862,972

Claims priority, application Japan, May 20, 1985, 60-108562; May 7, 1986, 61-105711

Int. Cl.[4] F16H *11/00*

U.S. Cl. 474—80 **15 Claims**



1. A rear derailleur for a bicycle, for shifting a driving chain from one to another of multistage rear chain gears of the bicycle, said derailleur comprising:

(a) a base member;

(b) a linkage mechanism comprising a support member, a pair of linkage members and a movable member;

(c) a first horizontal shaft supporting said linkage mechanism swingably to said base member;

(d) a chain guide including a guide sprocket and a tension sprocket;

(e) a second horizontal shaft supporting said chain guide swingably to said movable member of said linkage mechanism;

(f) a first spring interposed between said base member and said linkage mechanism and biasing said linkage mechanism in a direction of moving said guide sprocket away from said rear chain gears;

(g) a second spring interposed between said movable member and said chain guide and biasing said chain guide in a direction of applying tension to said chain, said first and second springs each having a spring force by which a distance between said guide sprocket and said rear chain gear is optimum when said chain engages with one of a smallest diameter rear chain gear and a largest diameter rear chain gear of said multistage rear chain gear; and

(h) a spring force control means for changing the spring force of one of said first and second springs with respect to the other by swinging motion of at least one of said linkage mechanism and said chain guide in excess of a predetermined angle of swing.

4,692,132

PROCESS FOR PREPARING A SEALED LAMINATED VESSEL

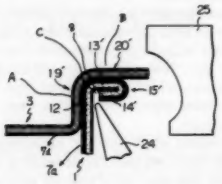
Fumio Ikushima, Yokohama; Senji Itoh, Ayase, and Kiyonori Kogashiwa, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 681,086, Dec. 13, 1984, which is a continuation of Ser. No. 507,921, Jun. 27, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 829,938

Claims priority, application Japan, Jun. 30, 1982, 57-111475; Jul. 9, 1982, 57-118430; Jul. 19, 1982, 57-124430

Int. Cl.[4] B31B *9/64, 1/90*

U.S. Cl. 493—103 **5 Claims**



1. A process for the preparation of a sealed laminated vessel, which comprises (i) applying to a laminate comprising a paper substrate and a metal foil and having heat-sealable resin layers on both the surface portions of the substrate and the foil a heat-sealable resin layer over at least that portion of the laminate to be formed into an inner side of a seam to cover a cut edge of the paper substrate, (ii) forming the laminate into a cylinder so that the metal foil is located on the inner side and the paper substrate is located on the outer side and lap-bonding an inner end of the laminate to an outer end of the laminate by heat sealing to form a barrel having a straight seam on the side surface thereof, (iii) bending outwardly the laminate on at least one open end of the barrel and bending inwardly a part of the bent portion so that it is lapped on the lower side of the remaining part of the bent portion to form a flat circumferential end portion on at least one open end of the barrel, (iv) fitting a lid member on the circumferential end portion of the barrel, said lid member being composed of a laminate comprising a heat-sealable resin layer and a metal foil, said lid member having a peripheral portion for engagement with the circumferential end portion through the heat-sealable resin layer, said lid member having a vertical rim-like inner wall and a horizontal flange wall, (v) heat sealing the lid member and the circumferential end portion of the barrel, and (vi) engaging the lid member and the circumferential end portion of the barrel with a molding roller having a section conforming to the final shape of the sealed portion to downwardly bend the flange wall of the lid member together with the circumferential end portion of the barrel heat-sealed thereto.

4,692,133

METHOD AND MACHINE TO FORM BOX PARTS

Alan L. Leeper, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Apr. 1, 1986, Ser. No. 847,078

Int. Cl.[4] B31B *1/62*

U.S. Cl. 493—128 **28 Claims**

28. A method of forming a unit of a box from a blank comprising two sides, a bottom and, at each end, an end flap supporting a cantilevered sealing tab, and two side tabs, one projecting from each of the two sides, the connection between

each end flap and the bottom constituting a fold line, which method comprises:

receiving the blank on a table having a surface to receive the blank;

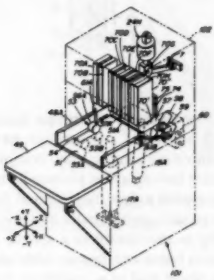
moving the blank along the surface of the table;

folding the two side tabs inwardly and toward each other;

folding the end flap inwardly;

folding the sealing tab inwardly and toward the inner surface of the end flap with the two side tabs sandwiched between the sealing tab and the end flap;

introducing the sides to a finger assembly comprising at least two pairs of press fingers adjacent to the table but initially spaced therefrom, the press fingers being movable between two alternate stable positions wherein the fingers of a pair are spaced from one another and closed upon one another respectively to receive a folded side of the blank and to close upon that side;



closing the space between the press fingers and the table thereby to move one of the said two sides between each of the spaced finger pairs;

closing the spaced fingers of each pair toward the other finger of the pair to close upon the side therebetween; and

closing the sealing tab and the end flap toward one another with the two side tabs pressed therebetween to adhere these last-named parts to one another, whereby an end is formed on said unit.

4,692,134

MACHINE FOR MAKING UNITIZED STACKS OF BAGS

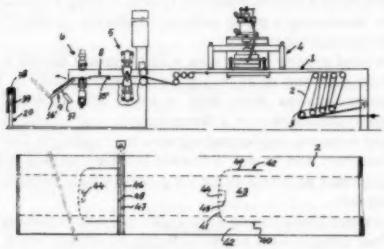
Carlos R. dos Santos Copia, Sao Paulo, Brazil, assignor to Maquinas NPU Ltda., Sao Paulo, Brazil

Filed Jun. 5, 1986, Ser. No. 870,881

Claims priority, application Brazil, Sep. 17, 1985, 8504518[U]

Int. Cl.[4] B31B *1/98, 23/86*

U.S. Cl. 493—196 **4 Claims**



1. In a machine for making a unitized stack of vest type bags from a tubular web of plastic film comprising, essentially, a horizontal frame, adjoining one of the extremities of which is a unit for unwinding the plastic film, the frame supporting, at the intermediate portion, means comprising transverse rollers for pulling the plastic film and cutting means for cutting the film to define straps and a joining area of the bags, and a sealing and cutter unit being provided at the opposite extremity of said frame to effect transverse seals for closing the bottom and interconnecting the straps of bags being formed in adjacent sections of the plastic film, and to effect transverse cuts for separating adjacent bags and, at the outlet of said sealing and cutter unit, there being provided a bundling and ejector unit for joining a plurality of bags to form a block and for ejecting the then finished block, the improvement comprising the bundling and ejector unit (**6**) having a sealing table (**7**), made up by a length of stock with an inverted "U" section, seated fixedly and transversely on the frame (**1**) and interposed between a tilting vane (**8**) and a tilting table (**9**), said length of "U"-section stock having a section thereof provided with a groove (**10**), adjoining which are lateral and external rubber seats (**11**) and through which extend one or more sealing electrodes in the shape of pins (**12**) that perform the joining of the plurality of bags making up a block and alongside of which are needles (**13**) to stabilize the bags on the sealing table (**7**), both sealing electrodes (**12**) and needles (**13**) being seated on a support (**14**) for moving upwards or downwards to apply or to withdraw said electrodes (**12**) and needles (**13**) from said groove (**10**) on the sealing table (**7**) and there being, above the latter, a corresponding depressing bar (**15**) formed by a length of stock with a rectangular section with the surface thereof facing the sealing table (**7**) being provided with a longitudinal groove (**16**) corresponding to groove (**10**) on the latter and adjoining which an external rubber seat (**17**) is also provided, said depressing bar (**15**) moving vertically for urging the plastic film (**2**) against the sealing electrodes (**12**) and stabilizing needles (**13**) and upon which a duct (**18**) is seated with a plurality of air-emitting nozzles (**19**) being turned toward the tilting vane (**8**) and which act in cooperation with the latter, the tilting vane (**8**) being interposed between the sealing table (**7**) and the sealing and cutter unit (**5**), whereas the tilting table (**9**) is interposed between the referenced sealing table (**7**) and a support carrier (**20**), the tilting vane (**8**) being in a horizontal position for, supporting the plastic film (**2**) in the displacement thereof from the sealing and cutter unit (**5**) to the table (**7**) and moving to a vertical position for extracting a finished bag from the sealing and cutter unit (**5**), which finished bag is extracted from above the tilting vane (**8**) by jets of air coming from the air-emitting nozzles (**19**), with the tilting table (**9**) being positioned slantingly and downwardly relative to the sealing table (**7**) and for supporting a block being formed and moving angularly for throwing a then formed block onto the support (**20**).

4,692,135

SEALER FOR SIDE GUSSETED BAGS

James R. Johnson, 3819 Greenhill Dr., Chamblee, Ga. 30341

Filed Apr. 7, 1986, Ser. No. 849,054

Int. Cl.[4] B31B *1/64, 37/64*

U.S. Cl. 493—394 **7 Claims**

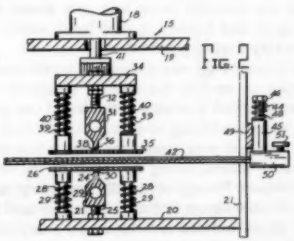


FIG.

1. In converting apparatus wherein a web traverses a path and actions are performed on said web as said web traverses said path, said web having an upper portion and a lower por-

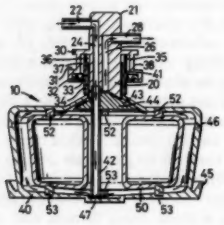
tion which are to receive actions separately, said converting apparatus including a dual sealer for sealing said upper portion and said lower portion simultaneously, said dual sealer including a first sealing bar disposed on a first side of said web and fixed with respect to said converting apparatus, a second sealing bar parallel to said first sealing bar and disposed on the opposite side of said web, and means for moving said second sealing bar towards said first sealing bar for sealing said web therebetween, and platen means between said upper portion and said lower portion of said web to maintain such portions separate, said platen means being disposed between said first sealing bar and said second sealing bar so that said upper portion of said web is sealed between said second sealing bar and said platen means and said lower portion of said web is sealed between said first sealing bar and said platen means, said platen means being movable towards and away from said first sealing bar.

4,692,136

CENTRIFUGE

Louis W. Feldman, and David H. Yawn, both of Houston, Tex., assignors to Cardiovascular Systems Inc., The Woodlands, Tex.

Continuation-in-part of Ser. No. 786,780, Oct. 11, 1985. This application Feb. 25, 1986, Ser. No. 833,940
Int. Cl.[4] B04B *7/08*
U.S. Cl. 494—38 **9 Claims**



1. A centrifuge for processing liquids having a first and second assembly of components one of which is capable of rotating relative to the other, the centrifuge comprising

said first assembly of components comprising core means for receiving and expelling the liquid and for transmitting the liquid to said second assembly, said core means having outwardly extending core shoulder means,

said second assembly of components comprising bowl means rotatively mounted about said core means for receiving the liquid and holding it, said bowl means not tapering outwardly from top to bottom,

hollow interior shell means mounted within said bowl means forming an area in the interior periphery of the bowl means in which elements in the liquid can accumulate,

said bowl means having upwardly extending neck means for receiving said core means, the neck means rotating about said core means during operation of the centrifuge, the neck means having outwardly extending neck shoulder means and wherein seal means are provided between said core means and said neck means for preventing the egress of liquid from between said core means, and

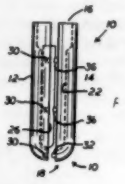
said seal means comprising first ring means connected to said core shoulder means and second ring means connected to said neck shoulder means so that said first ring means and said second ring means sealingly contact each other.

4,692,137

SPLIT TUBE CENTRIFUGE ROTOR ADAPTER

Linda J. Anthony, Mountain View, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 3, 1985, Ser. No. 719,179
Int. Cl.[4] B01D *00/00*
U.S. Cl. 494—85 **10 Claims**



1. An adapter for retaining a centrifuge sample tube in a generally cylindrical bucket of a centrifuge having a larger diameter than the centrifuge sample tube, comprising:

a first adapter section having a first portion formed generally as a semicylinder with a first longitudinal trough formed in a planar face of said semicylinder and a second portion formed generally as one fourth of a sphere with a cavity therein, said cavity being contiguous with said first trough for receiving a closed end of a centrifuge tube; and

a second adapter section having a second longitudinal trough therein, said first and second adapter sections and said first and second longitudinal troughs being configured such that said first and second longitudinal troughs cooperate to form an enclosed void when said first and second adapter sections are juxtaposed in facing relationship, said void having predetermined dimensions for receiving a centrifuge tube therein, said first and second sections having outer surfaces cooperating to form a generally cylindrical structure for fitting within a centrifuge rotor bucket comprising a generally cylindrical cavity.

4,692,138

PUMP BLOCK FOR INTERFACING IRRADIATION CHAMBER TO PHOTOACTIVATION PATIENT TREATMENT SYSTEM

Vernon H. Troutner, St. Petersburg, and Martin J. King, Seminole, both of Fla., assignors to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 665,833, Oct. 29, 1984, Pat. No. 4,578,056. This application Feb. 27, 1986, Ser. No. 834,257
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—4 **8 Claims**

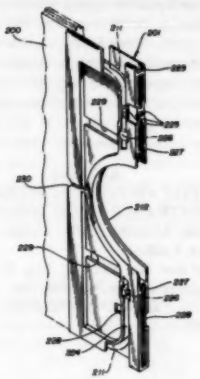
1. For use in a patient treatment system, a pump block assembly for interfacing a pump with an irradiation chamber, said assembly comprising:

(a) a fluid conduit comprising a first segment having a first fluid port and being linked by linkages serially in flow communication with, first, a metal tube provided for incorporating therein a thermocouple, and second, a second segment, said second segment terminating in a second fluid port and having a flexible pumping section for engagement with said pump for pumping fluid through said conduit;

(b) a pump block having a track-like recess for retaining said fluid conduit, said recess including an arcuate track portion for retaining said flexible pumping section of said second segment, said second segment having first and second expansions, said first expansion being provided between said metal tube and said pumping section and said second expansion being provided between said pumping section and said second port; and

(c) enlarged portions of said track-like recess in said pump

block for engaging said expansions, whereby said expansions cooperate with said enlarged portions to prevent



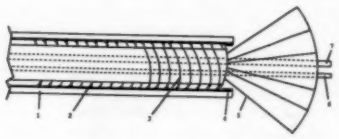
creeping movement of said conduit during pumping while isolating said conduit linkages from creeping forces.

4,692,139

CATHETER FOR EFFECTING REMOVAL OF OBSTRUCTIONS FROM A BIOLOGICAL DUCT

Frank B. Stiles, P.O. Box 41, Carp, Ontario, Canada K0A 1L0

Filed Sep. 30, 1985, Ser. No. 781,927
Claims priority, application Canada, Mar. 9, 1984, 449331
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—22 **25 Claims**



1. A catheter for effecting removal of obstructions from a biological duct, comprising a flexible aspiration tube for insertion into said duct such that a first end thereof is disposed in the vicinity of said obstruction and an opposite end thereof is connectable to a source of vacuum for providing suction within said duct at said first end in the vicinity of said obstruction, an injection tube disposed within said aspiration tube for injecting medication into said duct in the vicinity of said obstruction, and an ultrasonic energy source for transmitting ultrasound through said aspiration tube to the vicinity of said obstruction,

whereby said ultrasonic energy and medication cooperate to emulsify and fragment said obstruction and the emulsified and fragmented obstruction is removed from said duct through the aspiration tube in response to suction being provided by said source of vacuum, and

further including a flexible delivery sleeve enveloping said aspiration tube and screw threaded thereto at said first end, said aspiration tube being movable between extended and retracted positions relative to said sleeve by rotation therein.

4,692,140

LAVAGE/SUCTION TIP WITH DUAL SPLASH SHIELD

Daniel H. Olson, Louisville, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

Filed Jul. 1, 1985, Ser. No. 750,613
Int. Cl.[4] A61M *7/00*
U.S. Cl. 604—40 **17 Claims**

1. A lavage/suction tip or the like comprising:

a first elongated barrel including a distal tip and a proximal end, the first barrel having a first fluid passageway therein extending from one end to the other end;

a first shield connected to the first barrel and extending radially and distally outwardly from the distal tip of the first barrel defining an expanded state of the first shield; and

a second shield located about the first barrel and extending outwardly from the first barrel and adapted to fit about the first shield when the first shield is in said expanded state, and wherein the first shield has a first end and a second end connected therebetween by a wall member, wherein the first end is connected to the distal tip of the first barrel and the second end extends in a direction away from the distal tip and opposite the proximal end, the wall member forms an enlarged chamber therewithin which is in fluid communication with the first passageway, the chamber being open at its second end.

4,692,141

DOUBLE LUMEN CATHETER

Sakharam D. Mahurkar, 6171 N. Sheridan, Suite 1112, Chicago, County of Cook, Ill. 60660

Continuation of Ser. No. 356,081, Mar. 8, 1982, abandoned, and a continuation of Ser. No. 656,601, Oct. 4, 1984, Pat. No. 4,568,329. This application Jan. 29, 1986, Ser. No. 823,592
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—43 **13 Claims**

1. A double lumen catheter having an elongated tube with a proximal first cylindrical portion enclosing first and second lumens separated by an internal divider, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with the respective first and second lumens for the injection and removal of fluid, the first lumen extending from the proximal end of said elongated tube to a

first opening at the distal end of said elongated tube, and the second lumen extending from the proximal end of said elongated tube to a second opening at approximately the distal end of said first cylindrical portion, wherein the improvement comprises;

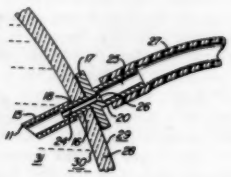
said elongated tube having at its distal end a smooth conical tapered tip that smoothly merges with a second cylindrical portion of said elongated tube, and said second cylindrical portion enclosing the first lumen from the conical tapered tip to approximately the location of said second opening, wherein said second sylindrical portion has a diameter substantially less than a full diameter of said first cylindrical portion but larger than said first lumen in the transverse direction normal to the plane of said flat divider.

4,692,142

SUTURELESS INFUSION CANNULA FOR OPHTHALMIC SURGERY

Bernard J. Dignam, deceased,, late of Belvedere, and Bonnie M. Dignam, heiress, 250 Bay View Ave., Belvedere, both of Calif. 94920

Filed Feb. 24, 1986, Ser. No. 832,906
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—51 **6 Claims**



1. An ocular infusion cannula comprising:

a first tube segment having an open end cut at an acute angle with respect to the axis thereof;

a second tube segment of lesser outer diameter than said first tube segment, joined coaxially to said first tube segment at the end opposite said open end to form a shoulder; and

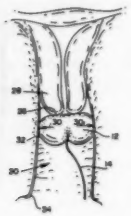
a flange encircling said second tube segment and spaced apart from said shoulder.

4,692,143

UNIT PACKAGE CONTAINING READY-TO-USE VAGINAL CONTRACEPTIVE

Ilona B. Gero, 180 East End Ave., New York, N.Y. 10028

Continuation-in-part of Ser. No. 598,208, Apr. 9, 1984, abandoned. This application May 19, 1986, Ser. No. 864,497
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—55 **10 Claims**



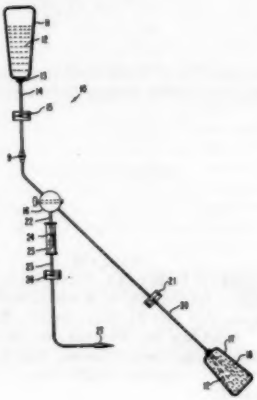
1. A vaginal contraceptive device comprising a sealed packet enclosing therein a porous polyurethane sponge premoistened prior to enclosure in the packet with a sterile bacteria-free aqueous solution of a small but spermicidally effective amount of a water-soluble spermicide, pectin and a pH control and swelling agent and preservative, the sealed packet being readily rupturable for removal of the porous polyurethane sponge with its absorbed components which is immediately ready for use by intravaginal insertion for the prevention of conception during coitus over a period of time up to about 24 hours, said premoistened polyurethane sponge after removal from said packet assuming dimensions exerting non-irritating pressure against the vaginal wall of the user and blocking entrance to the cervix when inserted, means being provided for removing the sponge at will after use.

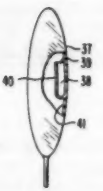
4,692,144

SYSTEM FOR PROVIDING INTRAVENOUSLY ADMINISTRABLE DRUG FORMULATION

Peter F. Carpenter, Atherton, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 642,233, Aug. 20, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,242
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—56 **6 Claims**





1. A method for administering a drug formulation to a warm-blooded animal, wherein the method comprises:

(a) admitting intravenously into an animal in need of a drug formulation a delivery member connected to an intravenously therapeutic delivery system, the system comprising:

(1) a first container housing an intravenously acceptable fluid;

(2) a second container housing an intravenously acceptable drug, said second container having an internal pouch that houses said drug, said pouch having fluid impermeable sidewalls, a fluid impermeable bottom wall and an upwardly facing opening so that a drug in the pouch leaves the pouch solely via said upwardly facing opening when fluid is introduced into said second container;

(3) means for conveying fluid from the first container into the second container;

(b) conveying fluid from the first container into the second container by moving at last one of said containers to a position whereby the second container is lower than the first container;

(c) letting fluid from the first container into the second container for contacting the drug, thereby forming in situ a drug formulation acceptable for intravenous administration; and,

(d) administering the drug formulation to the warm-blooded animal in a therapeutically effective amount by positioning the second container above the first container to permit drug formulation to flow from the second container to the delivery member for administering to said animal.

4,692,145

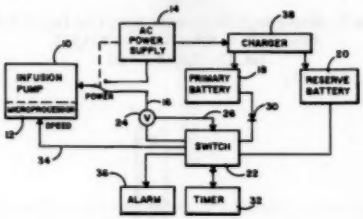
POWER SYSTEM FOR INFUSION PUMPS

Robert R. Weyant, Claremont, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Filed Oct. 15, 1984, Ser. No. 660,940

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—65 **12 Claims**



1. The method of providing operational safety for a variable-speed, battery operated infusion pump, comprising the steps of:

(a) operating said pump at normal operating speed substantially above the KVO speed in a primary mode wherein said pump is powered by a primary battery, as long as the primary battery voltage remains above a predetermined threshold level;

(b) operating said pump at normal operating speed in a reserve mode wherein said pump is powered at least by a reserve battery for a predetermined time interval after said primary battery voltage drops below said threshold;

(c) operating said pump at said KVO speed under reserve battery power following said interval.

4,692,146

MULTIPLE VASCULAR ACCESS PORT

Gerald E. Hilger, Medina, N.Y., assignor to Cormed, Inc., Murray Hill, N.J.

Filed Oct. 24, 1985, Ser. No. 791,124

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—93 **17 Claims**

13. A double lumen implantable vascular access port comprising a base, first and second separate lumens in said base with a base portion therebetween, first catheter means having first and second ends with said first end in communication with said first lumen and said second end remote from said first lumen, second catheter means having a first end in communication with said second lumen and a second end remote from said second lumen, a portion of said second catheter passing alongside said first lumen and through said base portion to said second lumen, a cap forming an upper portion of said first lumen, and an outer portion on said cap, said portion of said second catheter being located under said outer portion of said cap to thereby protect said portion of said second catheter

against inadvertent puncture by a needle passing alongside said outer portion of said cap.

4,692,147

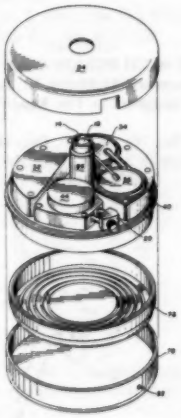
DRUG ADMINISTRATION DEVICE

Stephen R. Duggan, Rosemount, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 591,739, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 348,384, Feb. 12, 1982, abandoned, which is a continuation of Ser. No. 136,510, Apr. 2, 1980, abandoned. This application Jul. 19, 1985, Ser. No. 757,092

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—93 **11 Claims**



1. A medical device comprising:

reservoir for the storage of liquid;

means operatively coupled to said reservoir for dispensing said liquid;

means operatively coupled to said dispensing means for controlling said dispensing means in response to programming signals; and

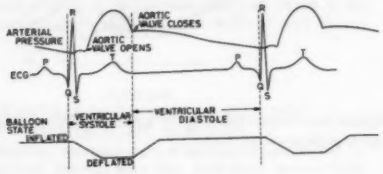
means for generating programming signals wherein said programming signals further comprise a set of dispensing signals wherein each of said dispensing signals further comprises a dosage value and an interval value representing a time period wherein no liquid is dispensed.

4,692,148

INTRA-AORTIC BALLOON PUMP APPARATUS AND METHOD OF USING SAME

Adrian Kantrowitz, Pontiac; Paul S. Freed, Bloomfield Hills, both of Mich.; Hiroyuki Tachi, Tokyo, and Akira Suzuki, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 28, 1986, Ser. No. 845,557
Int. Cl.[4] A61M *29/00*
U.S. Cl. 604—96 **9 Claims**



1. A method of disposing a balloon inside an aorta, comprising the steps of:

disposing at least a pair of spaced electrodes inside a thoracic aorta near a patient's heart;

sensing a R-wave and a P-wave by said electrodes, and

using the P-wave and R-wave morphologies and their related magnitude to determine the optimal placement of the balloon pump, as close as possible to the atria.

4,692,149

CATHETER WITH REMOVABLE CONNECTOR

Helmut W. G. Rosenberg, McHenry, Ill., and George W. Drach, Tucson, Ariz., assignors to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 683,055, Dec. 18, 1984, abandoned. This application Aug. 12, 1986, Ser. No. 895,770
Int. Cl.[4] A61M *29/00*
U.S. Cl. 604—99 **6 Claims**

1. A nephrostomy catheter, comprising:

an elongated shaft having a drainage lumen extending through the shaft, wherein the shaft includes an inflation lumen extending along the shaft, the catheter includes an elastic sleeve bonded in circumferential zones to a distal portion of the shaft, and an inflation valve of relatively small diameter permanently attached to the shaft and communicating with the inflation lumen;

said catheter having a hollow connector removably connected to a proximal end of the shaft

an adapter removably received in the connector; and

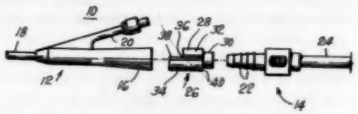
a drainage tube fixedly attached to the adapter.

4,692,150

TAMPER EVIDENT BAND

James P. Cianci, Gary, and James R. Gross, St. Charles, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Sep. 25, 1985, Ser. No. 780,042
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—111 **13 Claims**



1. A catheter drainage assembly comprising:

a catheter having a funnel at its proximal end;

a drainage tube adapter matable with said funnel; and

a tamper-evident band means comprising a tearable solvent expandable annular ring disposed about the juncture of said funnel and said drainage tube adapter.

4,692,151

PARENTERAL FLUID MEDICATION RESERVOIR PUMP

Seymour N. Blackman, 1530 Palisade Ave., Fort Lee, N.J. 07024

Filed Mar. 4, 1986, Ser. No. 835,942
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—132 **4 Claims**

1. A disposable parenteral fluid medication pump, comprising:

(a) an elongated reservoir expandable to an expanded position and collapsible to an original position, said reservoir having a pair of end walls spaced longitudinally apart of each other by a constant longitudinal distance, a pair of generally planar side walls integral with and extending longitudinally between the end walls, said side walls lying in parallel planes and being movable toward and away from each other in mutual parallelism in a transverse direction generally perpendicular to their planes to bound a variable transverse distance, and a pair of elastic walls integral with and extending between the side walls, said elastic walls being foldable toward and away from each other, all of said walls bounding an interior;

(b) a closeable inlet at one end wall and through which a parenteral fluid medication is introduced into the interior of the reservoir to expand the reservoir due to outward pressure exerted by the medication to the expanded position in which the side walls are moved far apart of each other and the elastic walls are unfolded to form a generally rectangular cross-section for the reservoir;

(c) a needle mounted at and extending through the other end wall, said needle being in fluid communication with the interior of the reservoir and having a pointed end insertable into a patient to be administered with the medication; and

(d) said elastic walls having a memery characteristic with a slow rate of return and being foldable toward each other, while concomitantly linearly and transversely moving the side walls closer together, from the expanded position to the original position during which the linearly moving side walls controllably and continuously discharge the medication through the pointed end of the needle in small doses over an extended period of time.

4,692,152

MEDICAL TUBE

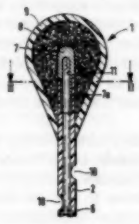
Carsten Emde, Berlin, Fed. Rep. of Germany, assignor to Fresnius AG, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,265

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409663

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—164 **10 Claims**



1. A medical device, particularly a catheter or feeding tube comprising: a tube having a passage therethrough, having a proximal end for receiving a flowable substance, a closed leading end portion closing the distal end of said tube, and at least one radial opening in said tube located close to but proximal from said closed end portion, said leading end portion comprising a metallic head portion having an axial bore journalled thereinto, and a withdrawable mandrin passing axially through said tube and into said bore in said head portion, and a substantially teardrop shaped bolus surrounding said metallic head portion, the portion of greater radius being at the distal end, said bolus comprising an inner segment of a pharmacologically harmless substance capable of being safely absorbed by the human system and a coating layer coating said inner segment of a physiologically acceptable material substantially resistant to stomach acids.

4,692,153

SURGICAL WOUND DRAIN DEVICE

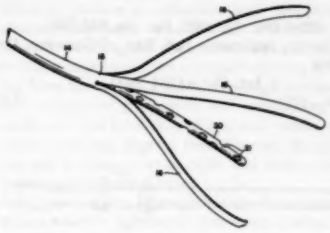
Richard B. Berlin; Richard B. Berlin, Jr., both of 309 Engle St., and Stephen L. Javna, 163 Engle St., all of Englewood, N.J. 07631

Filed Apr. 3, 1986, Ser. No. 847,704

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—171 **14 Claims**

1. A polyfunctional surgical drain device for a closed wound drainage system which comprises (1) an outer elongated flexible tubular member; (2) a detachably removable inner elongated flexible tubular member which is in a coextensive and slidable relationship with the outer tubular member, wherein the outer tubular member has one or more thin pliable tail strips extending from the distal end periphery, and the inner tubular member is a catheter with a central lumen and a plurality of perforated drainage ports and with the distal end extending beyond the distal end of the outer tubular member, and the catheter has a rim-flanged proximal end which is in abutting contact with the proximal end periphery of the outer tubular member; and (3) a hollow sleeve member with an end which forms a sealed attachment to the abutting proximal ends of the



tubular members, and with an end which is adapted to connect with a suction drainage fluid reservoir.

4,692,154

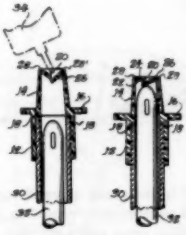
CATHETER GUIDE

Denis C. Singery, Hoffman Estates, and Ronald O. Gordon, Rolling Meadows, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 2, 1986, Ser. No. 869,416

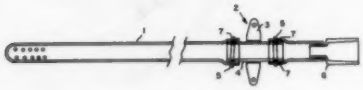
Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—172 **3 Claims**



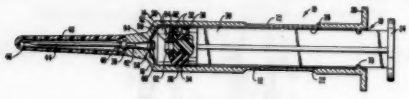
1. A catheter guide for use in inserting a catheter through a urethra into a bladder comprising a molded one-piece device of resilient material having a tubular portion of a predetermined length which is insertable partially into the urethra, and a plurality of flaps integral with the tubular portion and located at a distal end of said tubular portion, said flaps being molded in a first position, said flaps in said first position extending toward each other and away from said distal end into said tubular portion and said flaps having lengths such that an opening is formed for allowing lubricating material to be inserted into the guide through said opening after the catheter has been inserted partially into the tubular portion, said flaps being manipulatable by the catheter into a second closed position, the length of said flaps allowing said flaps to abut one another for preventing contamination of the catheter as said guide enters a urethra and said flaps being manipulatable by the catheter into a third position with said flaps extending out of said tubular portion for permitting the catheter to pass therethrough.

4,692,155
CATHETER
Gabriele Zimmer, Homburg, Fed. Rep. of Germany, assignor to pfm, Plastik fur die Medizin GmbH, Cologne, Fed. Rep. of Germany
Filed Dec. 12, 1985, Ser. No. 808,280
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445560
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—177 7 Claims



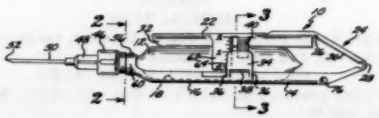
1. A two piece cut elastic catheter tube having a closed distal end having perforations and having a connecting part arranged at the rear end and having a metal cannula having a pair of plastic wings secured thereto inserted between the cut catheter tube in the proximity of the rear end of the catheter tube, the parts of the cut catheter being attached onto the metal cannula and fastened by means of fixing threads, the catheter tube being pressed on ring grooves on the exterior side of the metal cannula.

4,692,156
DISPOSABLE SYRINGE WITH RETRACTABLE CANNULA
Irene Haller, 7981 Stonehurst Ct., Pleasanton, Calif. 94566
Continuation-in-part of Ser. No. 806,100, Dec. 6, 1985, abandoned. This application Apr. 14, 1986, Ser. No. 851,532
Int. Cl.[4] A61M 5/32
U.S. Cl. 604—195 11 Claims



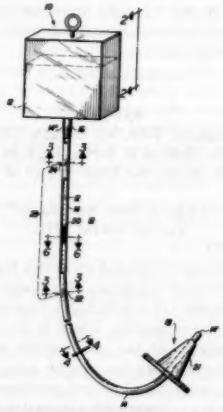
1. An improved hypodermic syringe, comprising:
a hollow barrel substantially closed at a forward end and provided with an open rearward end;
a piston means in reciprocable sealing engagement with the interior of said barrel, defining a chamber in said barrel for containing fluid;
a cannula, the rearward end of which is mounted at the closed end of said barrel, the forward end of which protrudes from said barrel, said cannula having an interior passage; and
an aperture at the forward end of said barrel communicating said cannula interior passage with said chamber, the improvement which comprises a means for retracting said cannula within said chamber, said retracting means including an engaging means at the forward end of said piston means attachable to the rearward end of said cannula, whereby subsequent to discharge of fluid from said chamber, said piston means engages and retracts said cannula, and wherein said barrel has a thin-walled section between its forward and rearward ends so that the barrel may be deformed after said cannula is retracted thereby preventing all subsequent protrusion of said cannula from said barrel or complete removal of said plunger from said barrel.

4,692,157
SQUEEZE-ACTUATED SYRINGE WITH POSITION-SELECTABLE LOCK
Boris Landau, Huntington Beach, and Marius Saines, Los Angeles, both of Calif., assignors to Ergomed, Huntington Beach, Calif.
Continuation-in-part of Ser. No. 695,457, Jan. 28, 1985, Pat. No. 4,581,021. This application Dec. 23, 1985, Ser. No. 812,773
Int. Cl.[4] A61M 5/18
U.S. Cl. 604—214 22 Claims



1. A syringe for use with a collapsible ampul adapted for attachment to a hypodermic needle, said syringe comprising:
a body having an exterior surface and an interior surface defining a receptacle adapted to receive said ampul, said body having a proximal end and a distal end;
pressure application means, operatively connected to the distal end of said body for applying pressure against said ampul received in said receptacle when said pressure application means is squeezed toward said interior surface; and
pressure-responsive locking means, engageable between said body and said pressure application means, for (a) defining a plurality of selectable positions for said pressure application means relative to said receptacle, and (b) releasably locking said pressure application means in a selected one of said selectable positions;
whereby said locking means engaged said pressure application means with successive ones of said selectable positions as said pressure application means is squeezed toward said interior surface.

4,692,158
PORTABLE IRRIGATION ASSEMBLY
Ingrid B. Bloxom, Jr., P.O. Box 357, Wicomico, Va. 23184
Continuation-in-part of Ser. No. 719,175, Apr. 2, 1985, Pat. No. 4,617,011. This application Feb. 3, 1986, Ser. No. 825,506
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—260 11 Claims



1. An irrigation assembly of the type designed for the flushing of fecal matter from an intestine, said assembly comprising:
(a) a container structure to contain irrigating liquid therein and thereby define a reservoir for storage of irrigating liquid prior to and during an irrigating process,

(b) introduction means for introducing the irrigating liquid into the intestine being flushed,

(c) a conduit having an elongated configuration and a hollow interior extending along the length thereof, said conduit attached at its opposite ends to said container and said introduction means respectively,

(d) said conduit interconnected in fluid communication with and between said container and said introduction means and structured to define a path of fluid fow of said irrigating liquid between said reservoir and an intestine to which that introduction means is secured,

(e) an indicator element dimensioned and configured to pass along a flow path on the interior of said conduit, said flow path defined by a predetermined length of said conduit spaced from said opposite end thereof,

(f) said indicator element structured to have a specific gravity substantially equal to water and be substantially suspended therein when said conduit is disposed in a substantially upright orientation,

(g) said indicator element further structured and disposed to travel in a direction of liquid flow along said flow path to a first end thereof as said irrigating liquid passes from said reservoir to said introduction means,

(h) said indicator element further structured to travel from said first end of said flow path to a second end thereof upon reverse flow of irrigating liquid along said path of fluid flow caused by establishment of peristaltic action within the intestine being flushed,

(i) said conduit being constructed along at least a portion of said flow path for monitoring of travel of said indicator element along the length of said flow path between said first and second end thereof,

(j) said first and said second ends of said flow path each comprising flow restricting structures formed on said conduit and dimensioned to prevent passage of said indicator element therebeyond,

(k) flow control means attached to said conduit and disposed and structured for controlling flow of said irrigating liquid from said reservoir to said introduction means and the intestine being flushed, and

(l) said flow control means activated to stop flow to the intestine upon travel of said indicator element to said second end of said flow path.

4,692,159

OSTOMY POUCH FLUSH NOZZLE

James J. Kuzemchak, P.O. Box 741, Indiana, Pa. 15701

Continuation of Ser. No. 773,294, Sep. 6, 1985, abandoned. This application Oct. 9, 1986, Ser. No. 917,303

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—277 **3 Claims**

1. A flushing device for a ostomy bag wherein the ostomy bag has an opening therein and a flexible annular ring having walls forming a U-shaped cross-section surrounding the opening in the bag extending outwardly away from said bag of a predetermined width, said flushing device comprising a circular plastic disk means, said disk means having a rear face and front face and comprises:

a base flange extending from the rear face of said disk means,

a cylindrical adaptor extending from said base flange and being smaller in diameter than said base flange and slightly larger in diameter than the inner diameter of the U-shaped flexible annular ring at the opening of said ostomy bag,

said cylindrical projection including a forward circular flange slightly larger in diameter than said cylindrical projection and smaller in diameter than said base flange, said forward lip positioned at the front end of said cylindrical projection at a distance from said base flange substantially the same as said width of said flexible annular ring surrounding the opening of said ostomy bag,

said disk means having an enlarged opening therein extending from the rear face thereof through the base flange and said cylindrical projection and terminating at the inner surface of said front face of said disk means, said enlarged opening having internal thread means therein for receiving and forming a water-tight seal with a male-threaded water nozzle from a hose,

at least one opening through the the front face of said disk means whereby when said disk means is attached to a hose and the front face is forced into the opening with the U-shaped annular ring surrounding the opening of said ostomy bag, said cylindrical projection between said base flange and said forward lip fits inside the opening within the walls forming said U-shaped flexible ring to retain the ring between said lip and base flange, so that the ring is firmly retained in water tight arrangement to enable the ostomy bag to be flushed without leakage.

4,692,160

URINE COLLECTOR FOR INCONTINENT WOMEN HAVING ZIG-ZAG WALLS

Max Nussbaumer, Scheibenstrasse 13, CH-3014 Bern CH, Switzerland

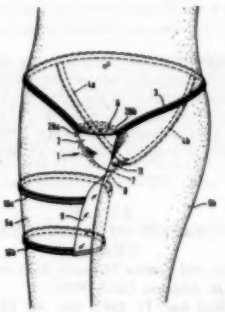
PCT No. PCT/CH85/00081, § 371 Date Jan. 14, 1986, § 102(e) Date Jan. 14, 1986, PCT Pub. No. WO85/05264, PCT Pub. Date Dec. 5, 1985

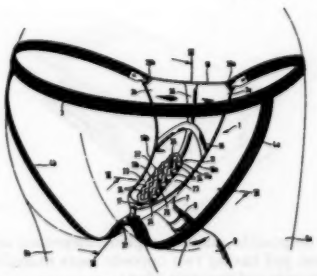
PCT Filed May 14, 1985, Ser. No. 818,805

Claims priority, application Switzerland, May 15, 1984, 2375/84

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—331 **9 Claims**





1. A urine collector for incontinent women comprising a

crotch piece having a substantially longitudinal axis and provided with attachment points at each corner for support belts and an outlet for connection to a urine collecting bag; characterized in that a collector structure is disposed in the crotch piece with a collecting cavity disposed under said collector structure and said outlet leading out of said cavity, wherein said collector structure comprises two side walls having a zig-zag shape in plan view extending along the longitudinal axis of said collector and joining at the respective ends of said collector structure, the urine collector further characterized in having boundary means as part of the crotch piece defining a moist zone surrounding the collector structure beyond which boundary means urine cannot penetrate said boundary means comprising a border of said crotch piece and undergoing transition to front and rear beads inwardly of the front and rear edges of said crotch piece.

4,692,161

HOT MELT ADHESIVE WASTE BARRIER

Paul P. Puletti, and Stanley J. Decowski, Jr., both of Glen Gardner, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 719,196, Apr. 3, 1985, Pat. No. 4,627,847.
This application Jun. 26, 1986, Ser. No. 878,908
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—366 **2 Claims**

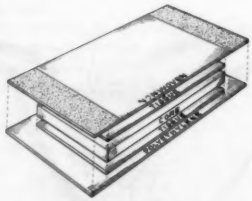
1. A disposable bed pad comprising an absorbent core encased in a liquid permeable nonwoven sheeting, wherein substantially the entire surface of the nonwoven sheeting which is in direct contact with the bottom surface of the absorbent core is coated with a water insoluble or water impermeable hot melt adhesive thereby providing a leakage resistant barrier.

4,692,162

SANITARY NAPKIN WITH INTEGRAL DISPOSAL WRAPPER

Norman Binker, and Sandra Miranda, both of 4344 Winchester, Apt. #15, Los Angeles, Calif. 90032

Filed Apr. 17, 1986, Ser. No. 853,174
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R **5 Claims**



1. A disposable sanitary napkin comprising an elongated absorbent pad having two opposite faces extending between two pad ends and two side edges;

a reversible bag affixed to one said face of said absorbent pad between said pad ends;

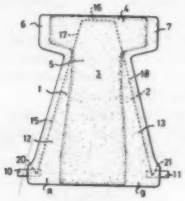
said bag including a wide portion including an open bag end oriented towards one of said pad ends and an elongated narrow bag portion terminating in a closed bag end oriented towards the opposite pad end, said folded bag being affixed to said pad face at both bag ends, said wide portion being normally folded to a width comparable to said narrow portion and flat against said pad face prior to and during use of said pad, said wide portion being reversible over the rolled pad as a disposal wrapper such that the bag may be reversed to receive and contain said pad for hygienic disposal after use and after said pad has been rolled up over the other of said pad faces with the bag bearing pad face facing outwardly of the roll, the rolling beginning with the pad end proximal to the closed end of the bag, said narrow portion being disposed and held between coil turns of the roll so as to at least partially roll up with said pad so as to more securely anchor said bag to said pad during reversal of said wide portion.

4,692,163

ABSORPTION ARTICLE SUCH AS A DIAPER OR A SANITARY NAPKIN, AND A METHOD FOR THE MANUFACTURE THEREOF

Leif U. R. Wiklund, and Maj I. Ternstrom, both of Mölnlycke, Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

Filed Nov. 26, 1985, Ser. No. 802,216
Claims priority, application Sweden, Nov. 30, 1984, 8406071
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A **24 Claims**



1. Absorption article such as a diaper or a sanitary napkin, comprising a liquid permeable first outer layer and a preferably liquid impermeable second outer layer being applied to either side of an absorption body for enclosing it, as well as elastic members applied in a prestretched condition for causing the edge portions of the article to fit closely around the body of the wearer, characterized in that the elastic members are included in a network of interesting elastic members extending over the crotch portion of the article and so disposed as to give the article elasticity in more than one direction.

4,692,164

BIOPROSTHETIC HEART VALVE, METHODS AND DEVICE FOR PREPARATION THEREOF

Sergei L. Dzemeshkevich, Moscow; Nikolai N. Zavalishin, Moskovskaya; Svetlana M. Krasovskaya, Moscow; Valery M. Sagalevich, Moscow; Boris A. Konstantinov, Moscow; Alexandr K. Nenjukov, Moscow, and Alexei S. Ivanov, Moscow, all of U.S.S.R., assignors to Moskovskoe Vysshee Tekhnicheskoe Uchilische, Imeni N.E. Baumana, Moscow, U.S.S.R.

Filed Mar. 6, 1986, Ser. No. 837,094
Int. Cl.[4] A61F *2/24, 2/76;* A61B *17/00*
U.S. Cl. 623—2 **11 Claims**

2. A bioprosthetic heart valve comprising:

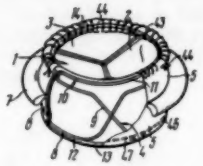
a frame of a resilient material with a circular base consisting

of separate arcuate portions; struts being a continuation of said arcuate portions and arranged over a toroidal surface; an additional ring arranged axially with relation to said circular base, consisting of separate arcuate portions which are a continuation of said struts;

an isolating spacer of a biologically inert material, impermeable to in growth of biological tissue, fitting around the external surface of said frame and replicating its toroidal shape;

a covering of a biologically inert material, fitting around the external surface of said frame, replicating its toroidal shape and located directly on top of said isolating spacer;

threads passing through said covering and spacer and stitching them to said frame;



a biological transplant made from a flap of biological tissue and having at least three sinus-like envelopes shaped like the aortic sinuses of the aortic heart vale, and cusps whose number corresponds to the number of said sinus-like envelopes, attached to said sinus-like envelopes and joining them smoothly; the upper edge of said biological transplant is secured on said additional ring and said covering so that the upper edge of each of said sinus-like envelope is located on said adjacennt arcuate portions of said additional ring; the lower edge of said biological transplant is secured to said covering above said arcuate portions of the circular base;

threads passing through said biological transplant and stitching it to said rings and covering.

4,692,165

HEART VALVE

Jack C. Bokros, Austin, Tex., assignor to CarboMedics, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 653,960, Sep. 24, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,032

Int. Cl.[4] **A61F** *2/24*

U.S. Cl. 623—2 **15 Claims**

1. A heart valve prosthesis comprising

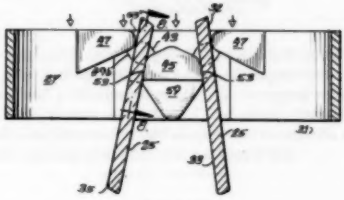
a generally annular body which has an interior surface that defines a central passageway for blood flow therethrough,

occluder means supported on said body for alternately blocking and then allowing the flow of blood through said passageway in a predetermined direction,

said occluder means having upstream and downstream major surfaces and being formed with aligned notch means at opposite locations in the periphery thereof,

a pair of aligned pivot posts projecting generally radially inward from said interior surface of said body, which posts have arcuate convex opposite lateral surfaces and are receivable within said notch means, and

stop means projecting inward from said interior surface at locations generally flanking each of said pivot posts and extending radially farther inward than said pivot posts,



said stop means presenting a pair of curved surfaces in regions adjacent to said pivot posts and overlying major surfaces of said occluder means, each of which curved surfaces lies in a region located intermediate of said opposite arcuate convex side surfaces of said post and extends radially inward thereof so as to provide a pair of oppositely disposed fulcrums that face each other, flanking said pivot posts,

said posts being proportioned to be received in said notch means so as to allow at least some nonrotational displacement of said occluder means away from one of said curved surfaces toward the other of said curved surfaces whereby supporting contact is alternated between respective curved surfaces and occluder means major surfaces as said occluder means repeatedly open and close.

4,692,166

USE OF HALOGENATED 4,5-METHYLENEDIOXYPHENOL IN THE DYEING OF KERATINOUS FIBRES

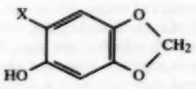
Alex Junino, Livry-Gargan; Gerard Lang, Saint-Gratien; Herve Andrean, Paris, and Jean Cotteret, Limay, all of France, assignors to L'Oreal, Paris, France

Filed Mar. 20, 1986, Ser. No. 841,813
Claims priority, application France, Mar. 21, 1985, 85 04224
Int. Cl.[4] A61K *7/13*; C07D *317/48, 317/52, 317/54*
U.S. Cl. 8—410 18 Claims

1. Oxidation dyeing composition for human hair, comprising in a cosmetically acceptable medium, and in sufficient amounts for dyeing the said human hair:

(a) one or several para type oxidation dye precursor containing two amino groups or an amino group and a hydroxy group bound in the para position on benzene rings, or alternatively on heterocyclic rings, this precursor being present in the form of free base or in salt form;

(b) at least one coupler of formula (I):



(I)

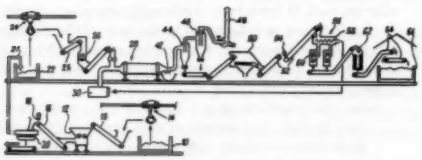
in which X denotes a chlorine or bromine atom.

4,692,167

APPARATUS FOR PROCESSING SOLID WASTES TO PRODUCE A FUEL

Jean-Pierre Levasseur, St Germain en Laye, France, assignor to Omnium de Traitements et de Valorisation (O.T.V.), Courbevoie, France

Filed Jan. 31, 1986, Ser. No. 824,317
Claims priority, application France, Feb. 13, 1985, 85 02032
Int. Cl.[4] C10L *5/46*
U.S. Cl. 44—2 12 Claims



1. Apparatus for obtaining a solid fuel from residential, industrial or similar types of wastes, comprising in combination, and successively from upstream to downstream:

(a) first grinding means to reduce the particle size of the initial wastes;

(b) magnetic separation means to eliminate ferrous metals;

(c) first screening means to separate smaller-sized fermentable organic materials from the rest of the wastes, or combustible fraction, able to be transformed into fuel;

(d) second grinding means designed to reduce the particle size of the fuel fraction still further;

(e) pneumatic drying means designed to reduce the water content of the fuel fraction and outputting a gas stream charged with said fuel fraction;

(f) gravity separation means designed to separate from the gas stream the heavy products contained in the fuel fraction;

(g) cyclone separation means designed to separate from the gas stream the fuel fraction freed of said heavy products;

(h) second screening means designed to eliminate the inorganic fines having a high ash content; and

(i) press granulating means designed to transform the fuel fraction coming from the second screening means into fuel granules;

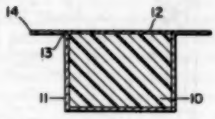
the mesh sizes of the first and second screening means being adjustable.

4,692,168

FLAMMABLE BARRIER WRAP FOR SOLID FUEL/FIRESTARTER COMPOSITION

Duane L. Dotson, Mountain Lakes, and Alex Forschirm, Parsippany, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jun. 10, 1986, Ser. No. 872,590
Int. Cl.[4] C10L *7/00*
U.S. Cl. 44—7.1 20 Claims



1. A packaged solid or gelled heating fuel comprising: a shaped solid fuel formed from a normally liquid fuel or a meltable fuel, and a flammable plastic film wrapped around said shaped fuel, at least one edge of said plastic film extending freely beyond the mass of said shaped fuel to provide an easily accessible ignition point for said packaged fuel.

4,692,169

USE OF ETHERIFIED POLYGALACTOMANNAN GUMS AS CARBONACEOUS SLURRY STABILIZERS

Warren W. Howland, Champlin; Robert E. Arquette, Minneapolis, and Shang-Ren Wu, St. Anthony, all of Minn., assignors to Henkel Corp., Ambler, Pa.

Continuation-in-part of Ser. No. 686,787, Dec. 27, 1984. This application Nov. 12, 1985, Ser. No. 795,521
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 30 Claims

1. In a carbonaceous slurry containing a stabilizer in an amount sufficient to stabilize said slurry wherein said stabilizer is selected from the group consisting of:

(a) an alkyl ether of a polygalactomannan

(b) a mixture of said alkyl ether and xanthan gum

(c) a mixture of an hydroxyalkyl ether of a polygalactomannan and xanthan gum

(d) a mixture of said alkyl ether and said hydroxyalkyl ether and xanthan gum wherein said alkyl group contains from 1–20 carbon atoms; said polygalactomannan gum alkyl ether has a degree of substitution of 0.05 to 3 and said xanthan gum in mixture (b), (c) and (d) comprises up to about 85 weight percent of the total mixture of said ether and said xanthan gum.

4,692,170

CHEMICAL COMPOUNDS TO BE USED AS SOLID CARRIERS FOR FUEL ADDITIVES

Alberto Santambrogio, Corsico, and Luciano Mattei, Milan, both of Italy, assignors to Agip Petroli, S.p.A., Rome, Italy

Filed Nov. 29, 1983, Ser. No. 556,137
Claims priority, application Italy, Dec. 2, 1982, 24561 A/82
Int. Cl.[4] C10L *1/18, 1/22*
U.S. Cl. 44—63 6 Claims

1. Compositions of dosing additives to fuel for internal combustion engines, comprising (1) solid carrier chemical compounds, which have a melting point between 70° C. and 130° C., are soluble in hydrocarbons and are selected from the group consisting of alkyl-substituted phenols, aromatic carbonates, alkyl-substituted pyrocatechols, and polymers of alkyl-substituted 1,2-dihydroquinoline; and (2) additives for fuel for

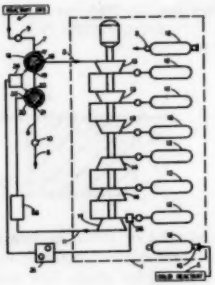
internal combustion engines which are liquid at room temperature.

4,692,171

SOLID WITH GAS REACTOR PLANT

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed Oct. 28, 1985, Ser. No. 791,798
Int. Cl.[4] C10J *3/02, 3/20*
U.S. Cl. 48—61 19 Claims



1. A solid with gas reactor plant comprising:
a fresh reactant gas connector pipe;
a product reacted gas connector pipe;
a number of different sources of fresh reactant gas, said number being at least one;
a number of separate sources of solid reactant, said number being at least one;
a number of separate product gas delivery pipes, said number being at least one;
means for connecting said fresh reactant gas connector pipe to said at least one source of fresh reactant gas;
means for connecting said product reacted gas connector pipe to said at least one product gas delivery pipe;
a cyclic char gasifier apparatus comprising:
a compressor means for compressing gases from a lower pressure to a higher pressure and comprising an integral number of stages, said integral number of stages being at least one, and each of said stages comprising a supply end and a delivery end;
means for driving said compressor means;
an expander means for expanding gases from a higher pressure to a lower pressure and comprising an integral number of stages, said integral number of stages being at least one, and each of said stages comprising an inlet end and a discharge end;
at least two separate containers, each of said at least two containers comprising pressure vessel means for containing any gas compressed thereinto, each of said at least two containers comprising at least one refuel end through which solid reactant can be placed inside said container, each of said at least two containers comprising at least one removal end through which non-gas products can be removed from the inside of said container;
a product gas collector pipe;
a reactant gas inlet;
wherein said number of compressor stages exceeds one and further comprises fixed open gas flow connections from the delivery end of each of said compressor stages, except one, to the supply end of one other stage of said compressor means, whereby said stages of said compressor means are connected in series so that the pressure of a particular gas mass, at delivery from each of said stages, increases as the gas mass is compressed through said series connected stages, from the supply end to the delivery end of each of said stages with a first of said stages in said series through which a gas mass first flows being both the lowest pressure stage and also that one stage whose supply end does not have a fixed open gas flow connection from the delivery end of any other stage of said compressor means, and with a last stage in said series through which a gas mass last flows being both the highest pressure stage and also the one stage whose delivery end does not have a fixed open gas flow connection to the supply end of any other of said stages of said compressor means;
fixed open gas flow connections from the supply end of the lowest pressure stage of said compressor means to said reactant gas inlet,
wherein said number of expander stages exceeds one and further comprises fixed open gas flow connections from the discharge end of each of said expander stages, except one, to the inlet end of one other of said stages of said expander means, whereby said stages of said expander means are connected in series so that the pressure of a particular gas mass, at discharge from each of said stages, decreases as said gas mass is expanded through said series connected stages, from the inlet end to the discharge end of each of said stages, with a first stage in said series through which a gas mass first flows being both the highest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the discharge end of any other stage of said expander means, and with a last stage in said series through which a gas mass last flows being both the lowest pressure stage and also that one stage whose discharge end does not have a fixed open gas flow connection to the inlet end of any other of said stages of said expander means;
fixed open gas flow connections from the discharge end of the lowest pressure stage of said expander means to said product gas collector pipe;
changeable gas flow connections, which are openable and closeable, from each of said at least two containers to each delivery end of each of said stage of said compressor means, and to each inlet end of each of said stages of said expander means;
wherein said at least two containers comprises a number of containers, at least equal to the sum of the number of compressor stages and the number of expander stages;
at least one refuel mechanism, said at least one refuel mechanism comprising:
means for transferring a volume of solid material from said at least one source of said reactant into said at least two containers when said refuel transfer means is connected to said refuel end of said at least two containers;
means for connecting said refuel transfer means to said refuel end of said at least two containers for a time period for refueling and for disconnecting said refuel transfer means from said refuel end of said at least two containers at the end of said refuel time period;
means for sealing said means for connecting and disconnecting and said refuel end of said at least two containers against gas leakage;
at least one means for removing non-gas products comprising:
means for transferring a volume of non-gas materials out of said at least two containers when said at least one means for removing is connected to said removal end of said at least two containers;
means for connecting said at least one means for removing to said removal end of said at least two containers for a time period for non-gas product removal and for disconnecting said at least one means for removing from said removal end of said at least two containers at the end of said non-gas product removal time period;
means for sealing said means for connecting and discon-

necting and said removal end of said at least two containers against gas leakage;

means for opening and closing said changeable gas flow connections so that each of said at least two containers is opened for a time period to each delivery end of each of said stages of said compressor means, in a subsequence of time periods of open gas flow connections to compressor stages, said sub-sequence proceeding in time order of increasing compressor stage delivery pressure, and is opened for a time period to each inlet end of each of said stages stage of said expander means, in a sub-sequence of time periods of open gas flow connections to expander stages, said sub-sequence of said expander stages proceeding in time order of decreasing expander stage inlet pressure, said sub-sequence of connections to said compressor stages being followed by said sub-sequence of connections to said expander stages, and these together comprise one sequence of time periods of open gas flow connections, each of said at least two containers is opened to only one of said stages during any one time period of said sequence of time periods, said sequence of time periods of open gas flow connections to said compressor stages and to said expander stages is repeated for each of said at least two containers by said means for opening and closing, for each of said at least two containers each said one sequence of open gas flow connections to said compressor stages and to said expander stages is a single cycle of compression and expansion;

means for controlling said means for opening and closing, and said means for connecting said refuel transfer means and said means for connecting said at least one non-gas product removing means, so that said repeated sequences of time periods of open gas flow connections, and any time periods available only for refueling and for non-gas product removal, are a continuous series of time periods for any one of said at least two containers, and so that the delivery end of each of said stages of said compressor means has an open gas flow connection to at least one of said at least two containers, and the inlet end of each of said stages of said expander means has an open gas flow connection to at least one of said at least two containers, during all time periods, whenever said plant is operating;

recycle means for connecting said product gas collector pipe to said reactant gas inlet and for disconnecting said product gas collector pipe from said reactant gas inlet;

supply means for connecting said fresh reactant gas connector pipe to said reactant gas inlet and for disconnecting said fresh reactant gas connector pipe from said reactant gas inlet;

diverting means for connecting said product gas collector pipe to said product reacted gas connector pipe;

means for driving said recycle means for connecting and disconnecting and said supply means for connecting and disconnecting and said diverting means for connecting so that:

said reactant gas inlet is connected to said product gas collector pipe whenever said product reacted gas connector pipe is disconnected from said product gas collector pipe, whereby product reacted gas is recycled to said reactant gas inlet;

and so that said product reacted gas connector pipe is connected to said product gas collector pipe whenever said reactant gas inlet is connected to said fresh reactant gas connector pipe, whereby fresh reactant gas is supplied to said reactant gas inlet and product reacted gas is diverted into said product gas connector pipe;

and so that, at any one time, said reactant gas inlet is connected to one and only one of the two, said product gas collector pipe, said fresh reactant gas connector pipe;

means for controlling said means for driving said recycle means, said supply means, and said diverting means, so that:

said reactant gas inlet is connected to said product gas collector pipe during a recycle sequence of cycles of compression and expansion on each of said at least two containers, said recycle sequence comprising a recycle integral number of cycles, said recycle integral number being at least one;

said reactant gas inlet is connected to said fresh reactant gas connector pipe during a fresh reactant sequence of cycles of compression and expansion on each of said at least two containers, said fresh reactant sequence comprising a fresh reactant integral number of cycles, said fresh reactant integral number being at least one;

each said recycle sequence is followed by at least one said fresh reactant sequence, and the last of said following fresh reactant sequence is followed by a recycle sequence, and each said recycle sequence followed by at least one fresh reactant sequence comprises a group of sequences, and said groups of sequences follow one another continuously whenever said plant is running;

whenever a recycle sequence is underway a fresh reactant sequence is not underway and whenever a fresh reactant sequence is underway a recycle sequence is not underway;

plural reaction chambers, the number of said plural reaction chambers being equal to the number of said at least two containers multiplied by a chamber integral number, and each of said plural reaction chambers comprising means for containing solid reactants and non-gas products so that gas can readily flow into said reaction chambers during compression and gas can readily flow out of said reaction chambers during expansion, and each of said plural reaction chambers further comprising a refuel end through which solid reactant can be placed inside said reaction chambers, and each of said plural reaction chambers further comprising a removal end through which non-gas products can be removed from the inside of said reaction chambers, and said chamber integral number being at least one;

means for fastening said plural reaction chambers separately inside said at least two containers so that:

each of said at least two containers contains and encloses a chamber integral number of said plural reaction chambers;

each of said plural reaction chambers refuel end connects to but one refuel end of its enclosing container;

each of said plural reaction chambers removal end connects to but one removal end of its enclosing container.

4,692,172

COAL GASIFICATION PROCESS

Robert J. Stellaccio, Spring, Tex., and Robert M. Suggitt, Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 632,351, Jul. 19, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 827,858

Int. Cl.[4] C10J *3/46*

U.S. Cl. 48—197 R **19 Claims**

1. A partial oxidation process comprising: (1) mixing together an ash-containing solid carbonaceous fuel containing less than about 2.0 wt. % sulfur, and in the noncombustible portion of said solid carbonaceous fuel less than 10 wt. % iron and less than about 8.0 wt. % of calcium with a sufficient amount of an ash-combining agent comprising iron sulfide containing material or supplemental iron containing reactant materials and sulfur containing reactant materials that react in the reaction zone in (2) to produce iron containing compounds and sulfur containing compounds that combine with the fuel ash; (2) reacting said mixture of materials optionally suspended in a liquid or gaseous medium by partial oxidation with a free-oxygen containing gas in the presence of H_2O in a free-flow reaction zone in a reducing atmosphere at a temperature

greater than about 2000° F. and below the fluid temperature of the ash in the solid carbonaceous fuel feed to the reaction zone and high enough to keep the ash produced in the molten state, and a pressure in the range of about 1 to 200 atmospheres, wherein the weight ratio of H_2O to the solid carbonaceous fuel is in the range of about 0.33 to 1.0, to produce a raw effluent gas stream which is discharged downward through a bottom outlet in the reaction zone and which substantially comprises H_2, CO, CO_2, H_2O, H_2S, COS, entrained particulate matter including molten ash containing iron compounds whose iron content is greater than 10 wt. % of the molten ash, and optionally at least one material from the group CH_4, N_2, Ar, and NH_3; wherein sufficient iron and sulfur are in the reaction zone so that the melting point of the solid carbonaceous fuel ash is decreased and the fluid temperature of the molten ash entrained in the raw gas stream is reduced about 100° F. or more below the fluid temperature of the ash in the solid carbonaceous fuel without the addition of said ash-combining agent; excess H_2S is present in the reaction zone and no free iron remains, and the mole ratio H_2S/H_2+CO in the raw gas stream is greater than 0.01; and (3) separating at least a portion of said particulate matter and molten ash from the raw gas stream.

4,692,173

PROCESS FOR CLEANING FILTER ELEMENTS

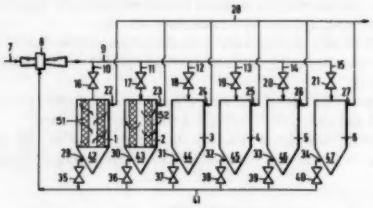
Hans Roos, Meerbusch, Fed. Rep. of Germany, assignor to Deutsche Filterbau GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,481

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505729

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—96 **1 Claim**



1. A method of cleaning filter elements in at least one of a plurality of filter chambers, in which each filter element has a dust-collecting side and a clean side, and each filter chamber has a closable connection from a conduit carrying pressurized dust-laden gas to the dust-collecting side of the respective filter element and also has a connection between a conduit carrying pressurized clean gas and the clean side of the respective filter element, and a closable outlet to a conduit for dust-laden scavenging gas; said method comprising the steps of: closing the connection between the conduit carrying the pressurized dust-laden gas and said at least one filter chamber, opening the connection to the dust-laden scavenging gas conduit of said at least one filter chamber; passing clean gas as a scavenging gas from the conduit carrying clean gas to the clean side of the filter element in said at least one filter chamber to thereby remove dust collected on the dust-collecting side of said at least one filter element, and adding the scavenging gas from said at least one filter chamber to the conduit carrying the pressurized dust-laden gas via a compressed air jet pump.

4,692,174

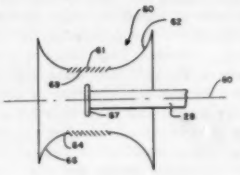
IONIZER ASSEMBLY HAVING A BELL-MOUTH OUTLET

Peter C. Gelfand, 56 Friar La., Trumbull, Conn. 06611; Walter V. Piulle, 960 Glennan Dr., Redwood City, Calif. 94061, and Louis F. Rettenmaier, 8790 W. Jefferson Ave., Denver, Colo. 80235

Continuation-in-part of Ser. No. 352,779, Feb. 26, 1982, abandoned, which is a continuation of Ser. No. 163,299, Jun. 26, 1980, abandoned. This application Nov. 1, 1983, Ser. No. 547,752

Int. Cl.[4] B03C *3/12, 3/40*

U.S. Cl. 55—129 **10 Claims**



1. A high-intensity ionizer assembly, comprising:

a venturi unit having an inlet connected to a source of particulate-laden gases, an outlet of a Rogowski shape, and a central throat section formed intermediate of said inlet and outlet; and

means for establishing a high-intensity electric field within said throat section wherein said electric field extends across the path of the particulate-laden gases flowing therethrough to charge the particles therein.

4,692,175

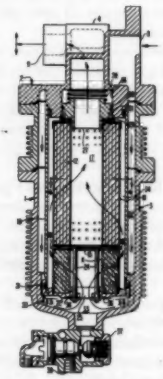
TWO-STAGE PRECOALESCER UNIT

Virgil L. Frantz, Salem, Va., assignor to Roanoke College, Salem, Va.

Filed Mar. 17, 1986, Ser. No. 839,956

Int. Cl.[4] B01D *39/08, 53/26*

U.S. Cl. 55—218 **9 Claims**



1. A two-stage precoalescer unit interposable in the flow path of contaminated compressed gas between a compressor or other source and desiccant-containing decontaminating means for coalescing and separating in successive stages loose oil and water and oil and water aerosol from the gas, comprising a housing having separable upper and lower parts, a perforate-walled canister in said housing, first and second stage coalescers mounted in tandem in said canister for respectively filtering, coalescing and separating loose oil and water and coalescing and separating oil and water aerosol from said gas, means

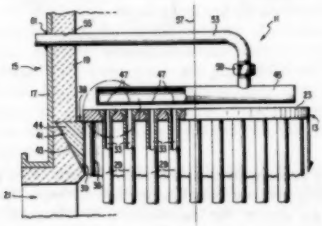
in said canister separating said coalescers and forcing said gas to flow therethrough in different directions, and an imperforate tube contained in said housing and containing said canister for defining with said housing and canister flow paths of said gas through said precoalescer unit.

7. A plural-stage precoalescer unit positionable in the flow path of contaminated gas from a compressor or other source for coalescing and separating loose oil and water and oil and water vapor from the gas in a plurality of successive stages, comprising a housing, a perforate-walled canister in said housing, first and second stage coalescers contained in tandem in said canister for respectively filtering, coalescing and separating loose oil and water and coalescing and separating oil and water vapor from said gas, inlet, outlet and draing ports in said housing, normally open outlet and normally closed drain valves in the housing and alternately seatable in vertically spaced internal valve seats, a piston mounting said outlet valve and having a head exposable to actuating gas, said valves being mounted on opposite end portions of a common stem for movement in unison against opposing spring forces respectively to open said drain port and close said outlet port on application of actuating gas to said piston.

4,692,176
THERMAL EXPANSION COMPENSATING BACK FLUSH MANIFOLD

Gordon A. Israelson, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1986, Ser. No. 816,783
Int. Cl.[4] B01D *29/32*
U.S. Cl. 55—302 **19 Claims**



9. A high temperature gas filtration system incorporating compensation for thermal expansion in the system, comprising:

a vessel having a longitudinal axis, an inlet for receiving high temperature gases containing particulates, and a filtered gas outlet;

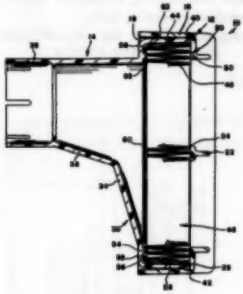
a filter assembly disposed between said inlet and said outlet for filtering particulates out of the gas, said filter assembly including a plate disposed transverse to and intersecting the longitudinal axis, said plate being made of a material having a first coefficient of thermal expansion and having a plurality of openings, filter elements mounted in the openings, and a flexible support surrounding said plate and connecting said plate to the vessel, said flexible support permitting said plate to thermally expand uniformly radially outwardly from the longitudinal axis upon an increase in temperature; and

a back flush manifold assembly mounted for back flushing a gas through the openings in said plate for back flushing particulates out of said filter elements, the back flush manifold assembly including a back flush manifold pipe disposed over said plate, made of the same material as said plate and having a plurality of back flush orifices each having a desired alignment over a respective one of the openings in said plate for directing a back flush gas into such openings, and a gas supply pipe having a selected length and being connected for delivering back flush gas to said back flush manifold pipe, the longitudinal axis intersecting the back flush manifold pipe at a given point at a base temperature, said gas supply pipe having one end forming a rigid connection with said vessel and another end forming a rigid connection with said back flush manifold pipe, said gas supply pipe being made of a material having a second coefficient of thermal expansion, said gas supply pipe thermally expanding away from said one end and said back flush manifold pipe thermally expanding from its connection with said gas supply pipe upon an increase in temperature, the material for said plate and said back flush manifold pipe and the material for and length of said gas supply pipe being selected based upon a predetermined relationship of the length of the gas supply pipe with the first and second coefficients of thermal expansion for causing the thermal expansion of said gas supply pipe to compensate for thermal expansion of said back flush manifold pipe so that upon an increase in temperature from the base temperature the given point at the back flush manifold pipe remains coincident with the longitudinal axis, whereby said back flush manifold pipe thermally expands uniformly radially from the longitudinal axis to maintain the desired alignment of the back flush orifices with the openings in said plate.

4,692,177
SIMPLIFIED AIR FILTER

Allen B. Wright, Coventry, R.I., and Willard L. Chichester, Battle Creek, Mich., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 773,279, Sep. 6, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 939,642
Int. Cl.[4] B01D *46/52*
U.S. Cl. 55—499 **8 Claims**



6. Fluid filter assembly comprising first and second molded housing members, said first housing member having integral side walls and an end wall connecting said side walls of the first housing member to define a box-like structure having an open end, the second housing member having integral side walls and an end wall connecting said side walls of the second housing member to define a box-like structure having an open end, the end wall of one of said members having structure defining openings to permit fluid flow therethrough, the end wall of said other housing member defining an outlet tube, the open end of said first housing member receiving the integral side walls of said second housing member, means joining said side walls of said members to assemble said members into a completed housing assembly, and a panel filter cartridge received within said housing assembly for filtering fluid communicated through said openings, said end walls of said housing members include portions engaging opposite sides of said panel filter cartridge to locate the latter within said housing assembly, the end wall of said other member receives an adhesive for sealing the cartridge against a portion of the end wall of said other housing member, the thickness of said cartridge causing the

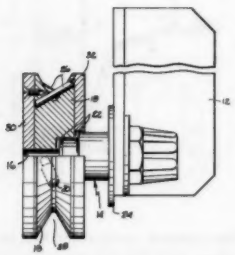
latter to be embedded in said adhesive when the cartridge is forced thereagainst during assembly of said housing assembly by engagement of the end wall of said one housing member with the side of said cartridge opposite the side of the cartridge embedded in the adhesive, and a perimetrically extending bead extends around the end wall of said other member and cooperating with the corresponding side walls of said other member to define a perimetrically extending groove therebetween for receiving said adhesive, said adhesive being constrained by said bead to be forced up a corresponding side wall as said pleats are forced into said adhesive.

4,692,178

FILAMENT GATHERING APPARATUS, SYSTEM AND METHOD

Henry D. Smith, Jr.; Russell D. Arterburn, both of Athens, Tenn., and John H. Miller, Littleton, Colo., assignors to Manville Corporation, Denver, Colo.

Filed Sep. 15, 1986, Ser. No. 906,864
Int. Cl.[4] C03B *37/028*
U.S. Cl. 65—2 **33 Claims**



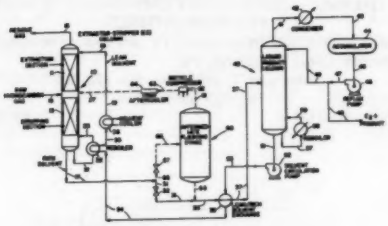
26. A method of producing glass strand from heat softenable, fiberizable glass material comprising: (a) drawing or attenuating glass filaments from molten streams of glass through use of an attenuation means, (b) gathering a plurality of filaments into a strand on a rotatable, gathering wheel assembly, said gathering wheel assembly including a rotatable, generally disk-shaped hub having walls for supporting a plurality of generally cylindrical rods about the hub's peripheral edge, said rods being secured to the walls of said hub such that each of said rods traverses the peripheral edge, said rods further being spaced apart from one another and arranged so as to define an annular gathering path upon which said filaments are gathered as the wheel rotates, the spacing between the rods being such that said path is at least 50 percent discontinuous, said discontinuity reducing the wrapping of glass filaments and strand about the gathering wheel by reducing surface contact between the filaments and strand and the wheel; and (c) collecting said strand with or without other strands.

4,692,179

PROCESS FOR USING ALKYL SUBSTITUTED C8-C10 AROMATIC HYDROCARBONS AS PREFERENTIAL PHYSICAL SOLVENTS FOR SELECTIVE PROCESSING OF HYDROCARBON GAS STREAMS

Yuv R. Mehra, Odessa, Tex., assignor to Advanced Extraction Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 784,566, Oct. 4, 1984, Pat. No. 4,617,038, which is a continuation-in-part of Ser. No. 759,327, Jul. 26, 1985, Pat. No. 4,623,371, which is a continuation-in-part of Ser. No. 758,351, Jul. 24, 1985, Pat. No. 4,601,738, which is a continuation-in-part of Ser. No. 637,210, Aug. 3, 1984, Pat. No. 4,578,094, which is a continuation-in-part of Ser. No. 532,005, Sep. 14, 1983, Pat. No. 4,526,594, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Dec. 13, 1985, Ser. No. 808,463
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—17 **27 Claims**



1. In a process for the removal of hydrocarbon gas liquids, comprising hydrocarbons heavier than methane, from a hydrocarbon gas stream, the improvement of selectively extracting said hydrocarbon gas liquids from said hydrocarbon gas stream with a preferential physical solvent which provides selective capability for recovery according to said selected degree of (a) ethane in amounts ranging from 2–98%, (b) propane in amounts ranging from 2–99%, (c) butane in amounts ranging from 2–100%, or (d) pentanes and higher molecular weight hydrocarbons in amounts ranging up to 100% which comprises:

A. selectively extracting and stripping said hydrocarbon gas stream with said physical solvent to produce a residue hydrocarbon gas stream of pipeline specifications and a rich solvent stream containing ethane and heavier hydrocarbon components, said preferential physical solvent being:

(1) rich in C_8–C_{10} aromatic compounds having methyl, ethyl, or propyl aliphatic groups and

(2) selective for ethane and heavier hydrocarbon components of the gas stream such that: (a) the relative volatility of methane over ethane is at least 5.0 and the hydrocarbon loading capacity, defined as solubility of ethane in solvent, is at least 0.25 standard cubic feet of ethane per gallon of solvent, or (b) the preferential factor determined by the multiplication of relative volatility of methane over ethane by the solubility of ethane in solvent, in standard cubic feet of ethane per gallon of solvent, of at least 1.25; and

B. distilling said rich solvent to produce said hydrocarbon gas liquids and said physical solvent.

4,692,180

APPARATUS AND METHOD FOR DEPOSITING A METAL OXIDE COATING ON A GLASS SUBSTRATE

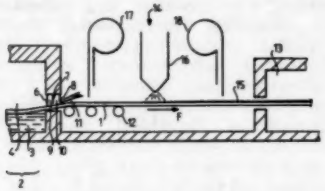
Jean-Marie Villain, Monchecourt, and Jacques Fremaux, Bougival, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Apr. 18, 1986, Ser. No. 853,817

Claims priority, application France, Apr. 24, 1985, 85 06242

Int. Cl.[4] C03B *18/20*

U.S. Cl. 65—32 **18 Claims**



1. In an apparatus for producing a glass ribbon wherein molten glass is directed across a top surface of molten metal float bath means having an enclosure containing a reducing atmosphere comprising a mixture of nitrogen and hydrogen gas supplied at a slightly positive pressure, said enclosure including at least one lock chamber for preventing the escape of the reducing atmosphere, the improvement comprising means for reducing the pressure within said at least one lock chamber wherein said lock chamber includes at least one airtight curtain means for separating said lock chamber from said molten metal float bath means, said curtain means being located crosswise in relation to the direction of advance of said glass ribbon, and said apparatus further comprising blower means located downstream from and proximal to the airtight curtain means located furtherest downstream from the float bath means in the direction of advance of the glass ribbon for directing an antiflame gas in the direction of a base portion of said curtain means.

13. In a method for depositing a coating of metal oxide powder onto a glass ribbon as said glass ribbon exits from a lock chamber of molten metal float bath means which contains a reducing atmosphere of a mixture of hydrogen and nitrogen gasses therein, and wherein a flame extending from said lock chamber of said molten metal float bath means in the direction of travel of the glass ribbon is generated due to the combustion of a portion of said hydrogen gas, the improvement which comprises:

reducing the intensity and size of said flame by venting said lock chamber so that the flame does not impinge upon the powder as it is being deposited, and

directing a flow of an antiflame gas towards said flame at an angle of approximately 45 degrees in relation to the vertical; thus improving the quality of said coating by reducing the amount of blemishes formed on a coated surface of said glass ribbon.

4,692,181

HERBICIDAL COMPOSITIONS

Hermann Bieringer, and Friedhelm Schwerdtle, both of Eppstein, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

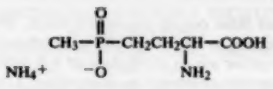
Continuation of Ser. No. 72,934, Sep. 6, 1979, abandoned. This application Jan. 22, 1982, Ser. No. 341,803

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839087

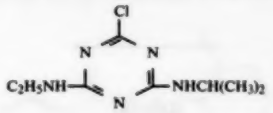
Int. Cl.[4] A01M *57/12*

U.S. Cl. 71—86 **7 Claims**

1. A herbicidal composition containing as an active ingredient, herbicidally effective amounts of compound A and compound B, wherein compound A has the formula



and compound B has the formula



wherein the proportion by weight of compound A to compound B is in the range of from 1:1.5 to 1:4.

4,692,182

HERBICIDAL ISOXAZOLIDINONE DERIVATIVES

Jun H. Chang, Princeton Junction, N.J., assignor to FMC Corporation, Philadelphia, Pa.

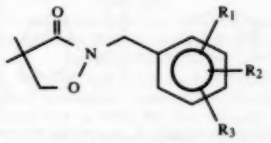
Filed May 19, 1986, Ser. No. 864,686

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

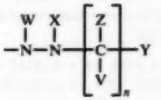
Int. Cl.[4] A01N *43/80*; C07D *261/04*

U.S. Cl. 71—88 **18 Claims**

1. A herbicidal isoxazolidinone of the formula



or an agriculturally acceptable salt thereof in which R_1 and R_2 are independently selected from -hydrogen and -halogen; and R_3 is of the formula



wherein

n is 0 or 1, and

when n is 0

W is selected from -hydrogen, one to six carbon alkyl, one to six carbon haloalkanoyl, and -benzoyl;

X is selected from -hydrogen and one to six carbon alkyl; and

Y is selected from -hydrogen, one to six carbon alkyl, three to eight carbon -cycloalkyl, one to six carbon alkanoyl, one to six carbon haloalkanoyl, -benzoyl, -2-nitro-5-(2-chloro-4-trifluoromethylphenoxy)benzoyl, -2,4-dichlorophenoxyacetyl, one to six carbon alkyloxy-carbonyl, one to six carbon alkylaminocarbonyl, -phenylaminocarbonyl, and one to six carbon alkylthiocarbonyl, provided that when Y and W are both haloalkanoyl or benzoyl groups, Y is the same as W; or

W and X together constitute a chemical bond; and Y is selected from =N and one to six carbon alkyloxycarbonyl; and

when n is 1,

X and Z together constitute a chemical bond;

W is -hydrogen;

V is selected from -hydrogen and one to six carbon alkyl; and

Y is selected from one to six carbon alkyl, -phenyl, -carboxyl, and one to six carbon alkyloxycarbonyl, or

V and Y together are an alkyl chain of 4–6 carbon atoms.

17. A herbicidal composition comprising a herbicidally effective amount of at least one compound of claim 1 in admixture with agriculturally acceptable adjuvants, carriers, diluents, or complementary pesticides.

4,692,183

DIPHENOXYMETHYLPYRIDINES AND COMPOSITIONS CONTAINING SAME HAVING HERBICIDAL PROPERTIES

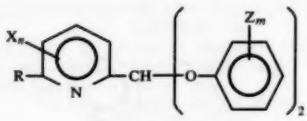
Sudarshan K. Malhotra, Walnut Creek, and Ingrid L. Evoy, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 656,834, Oct. 2, 1984, Pat. No. 4,606,757, which is a continuation-in-part of Ser. No. 452,584, Dec. 23, 1982, abandoned. This application Dec. 30, 1985, Ser. No. 814,855

Int. Cl.[4] **C07D** *213/57;* **A01N** *43/40*

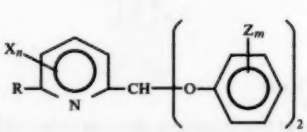
U.S. Cl. 71—94 **6 Claims**

1. A compound corresponding to the formula



wherein R represents cyano; X represents bromo, chloro or fluoro; n represnts an integer of 0 or 1; Z represents bromo, chloro, fluoro, alkylthio of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and m represents an integer of 0 or 1.

5. A method for controlling the growth of undesirable plants which comprises applying to plants, plant parts or their habitat a composition which comprises an inert carrier in admixture with a herbicidally effectiver amount of a compound corresponding to the formula



wherein R represents cyano; X represents bromo, chloro or fluoro; n represents an integer of 0 or 1; Z represents bromo, chloro, fluoro, alkylthio of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and m represents an integer of 0 or 1.

4,692,184

2,6-SUBSTITUTED PYRIDINE COMPOUNDS

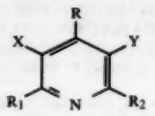
Len F. Lee, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 24, 1984, Ser. No. 602,021

Int. Cl.[4] **C07D** *213/80, 401/04, 405/04;* **A01N** *43/40*

U.S. Cl. 71—94 **34 Claims**

1. A compound represented by the structural formula



wherein:

R is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower alkenylalkyl, haloalkyl, haloalkenyl, C_{3-7} cycloalkyl, C_{3-6} cycloalkanylalkyl, phenyl, alkoxyalkyl, benzyloxymethyl, alkylthioalkyl, dialkoxyalkyl, (1-alkoxy-1-alkylthio)alkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkylsulfonylalkyl, alkylsulfinylalkyl, alkyl substituted with a dialkylsulfonium salt, cyanoalkyl, carbamoylalkyl, carbalkoxyalkyl, carbalkoxyalkenyl, formylalkyl, dialkylaminoalkenyl, saturated and unsaturated heterocyclic radicals selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl wherein the radical is joined to the pyridine ring by a C—C bond, and lower alkyl substituted with a saturated or unsaturated heterocyclic radical selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl;

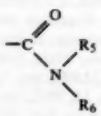
R_1 and R_2 are independently selected from alkyl, fluorinated methyl, and chlorofluorinated methyl radicals, provided that one of R_1 and R_2 must be a fluorinated methyl or chlorofluorinated methyl radical;

X is

where R_3 is as defined below; and Y is selected from the group consisting of

wherein Z_1 is selected from O and NR_7 where R_7 is selected from hydrogen and lower alkyl and wherein Z_2 is selected from O and S, and wherein R_3 in each occurrence is independently selected from hydrogen, alkyl C_{1-4}, alkenylalkyl C_{3-4}, haloalkyl C_{1-4}, cyanoalkyl, cycloalkanylalkyl, alkynylalkyl C_{3-4}, provided that when Z_2 is S, R_3 must be lower alkyl C_{1-2};

wherein R_4 is selected from hydrogen and halogen;



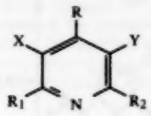
wherein R_5 and R_6 are independently selected from hydrogen, lower alkyl, and phenyl;

—CH_2OH; and

—C≡N.

13. A herbicidal composition containing a herbicidally effec-

tive amount of a compound represented by the structural formula



wherein:

R is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower alkenylalkyl, haloalkyl, haloalkenyl, C_{3-7} cycloalkyl, C_{3-6} cycloalkanylalkyl, phenyl, alkoxyalkyl, benzyloxymethyl, alkylthioalkyl, dialkoxyalkyl, (1-alkoxy-1-alkylthio)alkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkylsulfonylalkyl, alkylsulfinylalkyl, alkyl substituted with a dialkylsulfonium salt, cyanoalkyl, carbalkoxyalkyl, carbalkoxyalkenyl, dialkylaminoalkenyl, saturated and unsaturated heterocyclic radicals selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl wherein the radical is joined to the pyridine ring by a C—C bond, and lower alkyl substituted with a saturated or unsaturated heterocyclic radical selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl;

R_1 and R_2 are independently selected from alkyl, fluorinated methyl, and chlorofluorinated methyl radicals, provided that one of R_1 and R_2 must be a fluorinated methyl or chlorofluorinated methyl radical; and

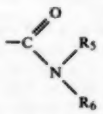
X is

where R_3 is as defined below; and

Y is selected from the group consisting of

wherein Z_1 is selected from O and NR_7 where R_7 is selected from hydrogen and lower alkyl and wherein Z_2 is selected from O and S, and wherein R_3 in each occurrence is independently selected from hydrogen, alkyl C_{1-4}, alkenylalkyl C_{3-4}, haloalkyl C_{2-4}, cyanoalkyl, cycloalkanylalkyl, alkynylalkyl C_{3-4}, provided that when Z_2 is S, R_3 must be lower alkyl C_{1-2};

wherein R_4 is selected from hydrogen and halogen;



wherein R_5 and R_6 are independently selected from hydrogen, lower alkyl, and phenyl;

—CH_2OH; and

—C≡N.

4,692,185

N-(ORTHO-SUBSTITUTED) BENZYL, 3-TRIFLUOROMETHYLPHENOXY NICOTINAMIDES AS HERBICIDES

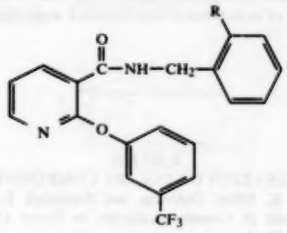
William J. Michaely, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 13, 1986, Ser. No. 818,149

Int. Cl.[4] A01N *43/40*; C07D *211/72*

U.S. Cl. 71—94 **11 Claims**

1. A compound having the formula



in which R is methyl, trifluoromethyl or bromo.

5. A method of controlling undesirable vegetation comprising applying to said vegetation or to a locus where control is desired a herbicidally effective amount of a compound according to claim **1**.

4,692,186

S-N-BUTYL-N,N-DIISOPROPYL THIOCARBAMATE AS A SELECTIVE HERBICIDE IN SUGARBEETS, CARROTS AND CABBAGE

Reed A. Gray, Saratoga, and Grant K. Joo, Cupertino, both of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

Filed Oct. 1, 1982, Ser. No. 432,220

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] A01N *37/00*; C07C *155/02*

U.S. Cl. 71—100 **3 Claims**

1. A method of selectively controlling undesirable vegetation in sugarbeets comprising applying an herbicidally effective amount of S-n-butyl-N,N-diisopropylthiocarbamate.

4,692,187

ISOUREAS AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Karl Kiehs, Lampertheim; Bruno Würzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

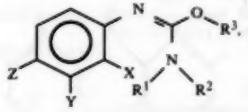
Filed Feb. 3, 1986, Ser. No. 825,627

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504453

Int. Cl.[4] C07C *127/26*; A01N *47/42*

U.S. Cl. 71—107 **8 Claims**

1. An isourea of the formula



(I)

where X, Y and Z are identical or different and are each hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_3-haloalkyl, or are each phenoxy which is unsubstituted or substituted by halogen or C_1–C_4-alkyl, or are each aryl-C_1–C_4-alkoxy, where the aryl radical may be alkylated, R^1 is C_1–C_3-alkyl, R^2 is

methoxy, R^3 is benzyl or is phenyl which can be monosubstituted or polysubstituted by C_1–C_5-alkyl, halogen, C_1–C_4-alkoxy, C_1–C_3-haloalkoxy, nitro, hydroxyl, C_2- or C_3-alkoxycarbonylmethoxy, 1-(C_2- or C_3-alkoxycarbonyl)-ethoxy or a radical —NH—R^4, where R^4 is C_2–C_4-alkoxycarbonyl, C_2–C_4-alkylcarbonyl, C_4–C_7-cycloalkylcarbonyl, N-(C_1–C_4-alkyl)-N-(C_1–C_4-alkoxy)-aminocarbonyl, N,N-di-(C_1–C_4-alkyl)-aminocarbonyl or C_2–C_3-alkoxycarbonyl-C_1–C_4-alkyl.

8. A process for combatting the growth of unwanted plants, wherein the unwanted plants or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of an isourea of the formula I as set forth in claim 1.

4,692,188

PREPARATION OF INK JET COMPOSITIONS

Christopher K. Ober, Oakville, and Randolph E. Branston, Sarnia, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1985, Ser. No. 787,594
Int. Cl.[4] B01J *13/02;* **C09D** *11/00, 11/10*
U.S. Cl. 106—23 **22 Claims**

1. A process for the preparation of ink compositions useful for jet printing processes which comprises (1) dissolving in a water immiscible organic solvent a polymer composition and an organic oil soluble dye; (2) adding an aqueous phase water surfactant mixture thereto; (3) effecting emulsification thereof; and (4) subsequently evaporating from the aforementioned mixture the solvent thereby resulting in an ink having particles consisting of polymer and entrained or entrapped dye suspended in the aqueous phase.

4,692,189

NOVEL COMPOSITIONS BASED ON INDANTHRONE BLUE PIGMENTS

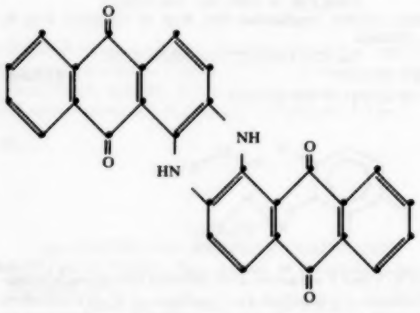
Fridolin Bäbler, Marly, Switzerland; Edward E. Jaffe, Wilmington, Del., and Bernhard Medinger, Giffers, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 21, 1986, Ser. No. 887,776
Int. Cl.[4] C04B *14/00*
U.S. Cl. 106—308 S **5 Claims**

1. A composition comprising

(a) an indanthrone blue pigment of formula I

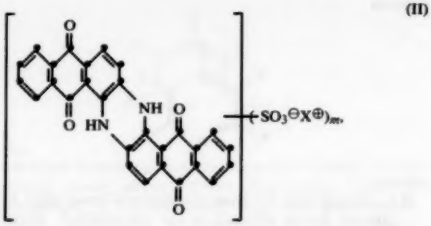
(I)



and

(b) a sulfonated indanthrone blue derivative of formula II

(II)



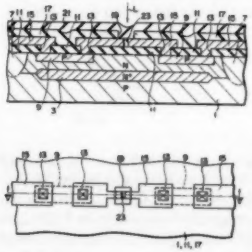
wherein $X^{\oplus}$ is $H^{\oplus}$ or a group of the formula $M^{n\oplus}/n$ or $N^{\oplus}(R)(R_1)(R_2)(R_3)$, M is a monovalent, divalent or trivalent metal cation, n is 1, 2 or 3, each of R, R_1, R_2 and R_3 independently is hydrogen, C_1-C_{18}alkyl, C_5-C_6cycloalkyl, phenyl or phenyl which is substituted by C_1-C_{18}alkyl, or R_2 and R_3, together with the linking nitrogen atom, are a pyrrolidine, imidazolidine, piperidine, piperazine or morpholine radical, or R_1, R_2 and R_3, together with the linking nitrogen atom, are a pyrrole, pyridine, picoline, pyrazine, quinoline or isoquinoline radical, and m is a value from 0.2 to 3.

4,692,190

TRIMMING OF METAL INTERCONNECTION LAYER BY SELECTIVE MIGRATION OF METAL ATOMS BY ENERGY BEAMS

Shigeru Komatsu, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1985, Ser. No. 813,039
Claims priority, application Japan, Dec. 27, 1984, 59-273740
Int. Cl.[4] H01C *7/00;* **B23K** *26/00*
U.S. Cl. 437—189 **9 Claims**



1. A method for manufacturing a semiconductor device, comprising the steps of:

preparing a semiconductor body;

forming at least one insulating layer on said semiconductor body;

forming at least one interconnection layer on said insulating layer;

forming a first insulating film above and contacting at least one predetermined are including at least a portion of said interconnection layer;

forming a second insulating film above and contacting said interconnection layer at an area other than said predetermined area, a ratio of a thermal expansion coefficient of said first insulating film to that of said interconnection layer being smaller than a ratio of a thermal expansion coefficient of said second insulating film to that of said interconnection layer to apply a stress at the predetermined area of said interconnection layer at times when said interconnection layer is heated; and

directing an energy beam onto the predetermined area of the

interconnection layer, thus heating the predetermined area to a temperature between 400° to 600° C. to permit migration of atoms of the predetermined area of said interconnection layer into said first insulating film at times when said interconnection layer is heated by said energy beam to a temperature between 400° to 600° C.

4,692,191

METHOD OF IMPROVING FUNCTIONS OF SURFACE OF ALLOY STEEL BY MEANS OF IRRADIATION OF LASER BEAM, AND ALLOY STEEL AND STRUCTURE MADE BY THE METHOD

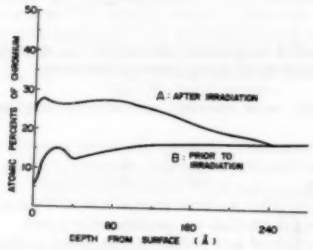
Shigeyoshi Maeda; Masahiro Yamamoto; Hiroyasu Omata, and Hideya Okada, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 869,783

Claims priority, application Japan, Jun. 4, 1985, 60-120967; Oct. 8, 1985, 60-222770; Mar. 8, 1986, 61-49543

Int. Cl.[4] C23C *22/50*

U.S. Cl. 148—6.14 R **10 Claims**



1. A method of improving surfaced function of a chromium containing alloy steel, comprising the steps of:

providing a chromium containing alloy steel having a surface,

providing an aqueous solution of an oxidizing acid or of salt of said acid so that the solution is in contact with the surface of the alloy steel,

irradiating the surface of the alloy steel with laser beams through said aqueous solution so that at least the chromium constituent of the alloy steel is concentrated in at least a part of said surface.

4,692,192

ELECTROCONDUCTIVE SPRING MATERIAL

Kazuo Ikushima, Nagoya; Takaharu Iwadachi, and Syuhei Ishikawa, both of Handa, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 16, 1985, Ser. No. 776,454

Claims priority, application Japan, Oct. 30, 1984, 59-228499; Jan. 22, 1985, 60-10620; Jan. 22, 1985, 60-10621

Int. Cl.[4] C22C *9/06*; C22F *1/08*

U.S. Cl. 148—12.7 C **15 Claims**

1. An electroconductive spring material comprising 1.8 to 3.0% by weight of Ni, 0.15 to 0.35% by weight of Be, 0.2 to 1.2% by weight of Si and a remainder of the spring material being copper, said spring material having a stress relaxation of at least 84%, a tensile strength of at least 75 kgf/mm^2 and a bending formability of 1–3 R/t.

4,692,193

PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING A LOW WATT LOSS

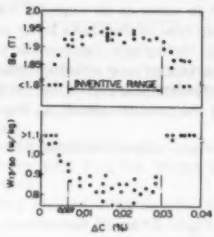
Yasunari Yoshitomi; Katsuro Kuroki, and Kenzo Iwayama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,294

Claims priority, application Japan, Oct. 31, 1984, 59-228014

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 **4 Claims**



1. A process for producing a grain-oriented electrical steel sheet, comprising the steps of:

annealing a hot-rolled strip consisting of from 2.5 to 4.0% of Si, from 0.03 to 0.10% of C, from 0.015 to 0.040% of acid-soluble Al, from 0.0040 to 0.0100% of N, from 0.01 to 0.04% of S, from 0.02 to 0.2% of Mn, at least one element selected from the group consisting of 0.04% or less of Se, 0.08% or less of Cu, and 0.4% or less of Sn, Sb, As, Bi, and Cr, and Fe in balance;

cold-rolling at least twice to obtain a sheet having a thickness of from 0.10 to 0.23 mm, in which the final cold-rolling is carried out at a heavy reduction of from more than 80% to 95%;

intermediate annealing between the cold-rolling steps:

decarburization annealing after the final cold-rolling; and,

finishing annealing, wherein said process is characterized by providing an intermediate decarburization annealing step after the hot-rolling step and prior to the completion of final cold-rolling and wherein said intermediate decarburization step reduces the C content in an amount of from 0.0070 to 0.0300% based on the total composition of the strip.

4,692,194

METHOD OF PERFORMING SOLUTION GROWTH OF A GAAS COMPOUND SEMICONDUCTOR CRYSTAL LAYER UNDER CONTROL OF CONDUCTIVITY TYPE THEREOF

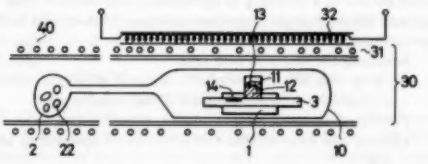
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation-in-part of Ser. No. 729,054, Apr. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 473,675, Mar. 8, 1983, abandoned. This application Sep. 25, 1986, Ser. No. 904,759

Claims priority, application Japan, Mar. 9, 1982, 57-37526

Int. Cl.[4] H01L *21/208*

U.S. Cl. 437—120 **4 Claims**



1. A method of epitaxially growing a GaAs crystal layer on

a GaAs substrate using a solution growth method which controls the conductivity type of the GaAs crystal layer being grown from a solution comprising a Ga melt as the solvent and a GaAs source crystal as a solute, said method comprising the steps of;

(a) conducting an epitaxial growing process using a solution growth method to control the conductivity type of the GaAs crystal layer being grown at constant temperature and temperature difference, the crystal layer being grown from a solution comprising a Ga Melt as the solvent and a GaAs source crystal as a solute;

(b) introducing into said solution an amount of amphoteric element Si to serve as an impurity for determining the conductivity type of the GaAs layer; and

(c) supplying, throughout the growth process, As vapor onto the surface of said solution contacting said GaAs substrate on which said crystal layer is to be grown, while controlling the pressure of said As vapor in the range of:

$$P_{As1} = \log P_{As} > -0.8 \log (Si/Ga) - 0.3 \text{ for n-type,}$$

and

$$P_{As2} = \log P_{As} < -0.8 \log (Si/Ga) - 0.3 \text{ for p-type}$$

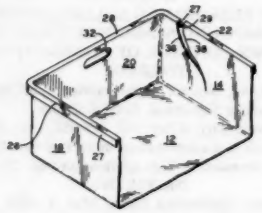
where P_{As} is expressed in Torr and Si/Ga in weight % and Si/Ga is $\leqq 1 \times 10^{-1}$ weight %, thereby forming an epitaxial GaAs crystal layer on a GaAs substrate.

4,692,195

METHOD FOR REPAIRING AND REINFORCING A PLASTIC TOTE

Danny T. Allen, 2519 Cass St., Fort Wayne, Ind. 46808, and Mark S. Allen, 1823 Woodhaven Dr., Fort Wayne, Ind. 46819

Filed Jun. 9, 1986, Ser. No. 872,116
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—98 **9 Claims**



1. A method for repairing and reinforcing a plastic tote, said tote including a plurality of upstanding sidewalls, at least one of said sidewalls including at least one tear therein, said method comprising:

bevelling the edges of said tear;

welding said tear with a plastic material of a type which is compatible with the material of said plastic tote;

providing a closed loop of plastic material;

placing said loop around said plurality of upstanding walls; and

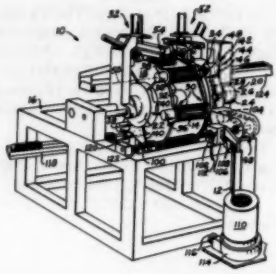
welding said loop to said upstanding walls.

4,692,196

APPARATUS AND METHOD FOR WRAPPING AN EXTERNAL TAPE SUPPORT ABOUT A FILTER ELEMENT ASSEMBLY

Norman W. Ellegood, Fremont; Joel L. Fritsche, Sunnyvale, both of Calif.; John J. Groezinger, Dunlap, Ill.; Keichi Ikeda, San Jose, Calif., and Ronald W. Streitmatter, Toulon, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 23, 1985, Ser. No. 812,678
Int. Cl.[4] B32B *1/00*
U.S. Cl. 156—187 **9 Claims**



1. An apparatus for wrapping an external tape support about a pleated filter element, the apparatus comprising:

a frame;

an indexable turret assembly rotatably mounted on said frame;

means for sequentially rotating said turret assembly in one direction between a plurality of predetermined radial positions;

a plurality of filter element clamps rotatably mounted at spaced radial positions on said indexable turret;

means at a first of said predetermined radial positions for controllably rotating one of said filter element clamps about a longitudinal axis in response to said one clamp being radially aligned with said first predetermined radial position, said means including a drive motor mounted on said frame at said first radial position and clutch means for selectively connecting said motor to a preselected one of said filter element clamps;

means for selectively positioning a strand of tape along said longitudinal rotational axis of said clamp in a spaced-apart spiral pattern about said pleated filter element; and

means for severing said strand of tape and wrapping the severed ends of said tape about respective pleated filter elements, said severing and tape-end wrapping means being mounted on said frame at a position between said first predetermined radial position and an adjacent second radial position on said indexable turret.

9. A method for wrapping an external tape support about a pleated filter element, including the steps of:

conveying a first pleated filter to a clamp fixture mounted on an indexable turret assembly;

clamping said first pleated filter between opposed face surfaces of said clamp fixture;

indexing said turret assembly and aligning said clamp fixture with a first radial position;

contacting a continuous strand of adhesive-coated tape with at least one outer edge surface of said first pleated filter carried in said clamp fixture;

cutting said continuous strand of tape at a position between said first radial position and a radial position at which a second pleated filter element has a spirally-wound tape support previously disposed thereon;

pressing a severed end of said adhesive-coated tape into contact with the outer edge surfaces of said first pleated filter assembly at said first radial position;

rotating said first pleated filter element at said first radial position about a longitudinal axis and simultaneously moving the position of said tape material in one direction along said longitudinal axis to spirally wrap said tape externally about said first pleated filter element;

indexing said spirally-wound first pleated filter element to said second radial position;

contacting the continuous strand of adhesive-coated tape with at least one outer edge pleat of a third pleated filter element positioned at said first radial position;

cutting said continuous strand of tape at a position between said first and second radial positions;

pressing a severed end of said adhesive coated tape into contact with the outer edge surfaces of said first pleated filter element;

indexing said spirally-wrapped first pleated filter element to a third radial position; and,

conveying said spirally-wrapped first pleated filter element from said third radial position.

4,692,197

METHOD FOR MANUFACTURING CORRUGATED TUBES

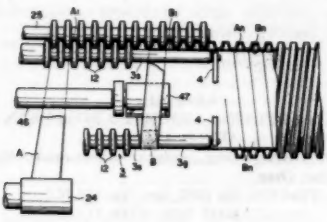
Koutarou Ueda, Fuji; Noboru Hasegawa, Fujisawa; Akio Machihara, Yokohama; Masaharu Kusaka, Yokosuka; Kobei Orii, Miura, and Yoshiro Noguchi, Odawara, all of Japan, assignors to Toyo Chemical Co., Ltd., Kamakura, Japan

Division of Ser. No. 615,977, May 31, 1984, Pat. No. 4,575,400. This application Nov. 20, 1985, Ser. No. 800,002

Claims priority, application Japan, Jun. 8, 1983, 58-102465; Mar. 22, 1984, 59-53582; Mar. 23, 1984, 59-54483

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 156—189 **4 Claims**



1. A method of manufacturing a corrugated tube having a smooth inner wall surface along a length of the tube and axially extending spiral convolutions to define a corrugated outer wall in longitudinal cross-section comprising the steps of:

arranging in a circular array a plurality of rollers each rotating at the same speed such that an imaginary cylinder is defined about a central axis by said rollers, said rollers having longitudinal axes parallel to each other but offset with respect to the central axis of the imaginary cylinder;

continuously feeding a first strip of synthetic resin material in a softened state generally perpendicularly to a length of said rollers in such a manner that said strip is helically wrapped around and advanced axially along said imaginary cylinder defined by the rollers with portions of adjacent turns of the strip overlapping one another and welding together to form a continuous tube, each of said rollers having a first portion with axially spaced annular ridges around an outer periphery thereof and a second portion with a smooth surface, said ridges of a respective roller being so arranged that associated successive ridges of each adjacent roller are aligned in a spiral path around said imaginary cylinder, said first strip of synthetic resin material being fed onto the imaginary cylinder while being pressed onto at least one of said first portions of the rollers so that said convolutions are formed on the strip by the ridges, while one turn of the first strip being wrapped around said imaginary cylinder is overlapped by a next succeeding turn of the strip, thereby forming said corrugated outer wall; and

continuously feeding a second strip of synthetic resin material from inside said imaginary cylinder, said second strip of synthetic resin material in a softened state being fed onto an inner surface of said outer wall and bonded thereto and guided by and spirally wrapped around said second portion of each roller so that the smooth inner wall is formed on the inner surface of said outer wall, while one turn of the second strip being wrapped around said second portions of the rollers is overlapped by a next succeeding turn of the second strip, thereby forming said smooth inner wall surface.

4,692,198

METHOD OF PRINTING A PATTERN ON A SURFACE RECEPTIVE TO SUBLIMATION PRINTING

Peter A. Borresen, Vejle, Denmark, assignor to A/S Modulex, Billund, Denmark

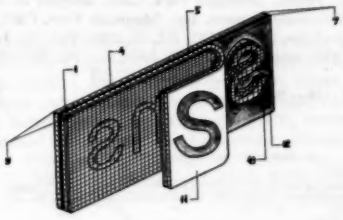
PCT No. PCT/DK84/00039, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO84/04496, PCT Pub. Date Nov. 22, 1984

PCT Filed May 16, 1984, Ser. No. 694,828

Claims priority, application Denmark, May 17, 1983, 2193/83

Int. Cl.⁴ B44C *1/17*; B32B *31/00*; D06P *1/02*

U.S. Cl. 156—235 **1 Claim**



1. A method of printing a pattern on a surface receptive to sublimation dye comprising the steps of

(a) providing a sublimation foil comprising a carrier foil having a layer of sublimation dye on its front side, its back side being bonded to an auxiliary carrier by means of an adhesive of greater adhesiveness to the auxiliary carrier than the carrier foil;

(b) cutting or punching the pattern to be transferred in mirror-reversed form in said carrier foil without cutting or punching through the auxiliary carrier;

(c) removing the excess carrier foil from the auxiliary carrier so as to expose the adhesive surrounding a positive pattern or surrounded by a negative pattern;

(d) contacting the surface with the auxiliary carrier whereby said exposed adhesive surrounded by or surrounding the pattern fixes said auxiliary carrier to the surface; and,

(e) thereafter heating said dye under pressure to transfer said pattern to said surface.

4,692,199

METHOD AND APPARATUS FOR BONDING FABRIC TO A FOAM PAD

Eric F. Kozlowski, and Edmund R. Kruger, both of Sterling Heights, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

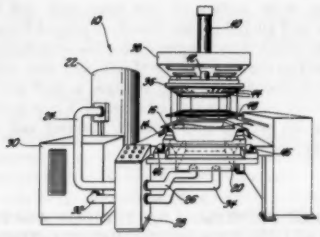
Filed Dec. 13, 1985, Ser. No. 808,841

Int. Cl.⁴ B32B *31/06*

U.S. Cl. 156—245 **18 Claims**

1. A method of fabricating a cushion assembly (**50**, **50'**) comprising the steps of; placing a fabric layer (**14**) over a mold surface of a mold (**18**), placing an air impervious adhesive film

(16) over the fabric layer (14), applying a vacuum pressure over the mold surface (18) and through the fabric layer (14) to draw the adhesive film (16) down against the fabric layer (14) and to urge the fabric layer (14) against the mold surface (18),



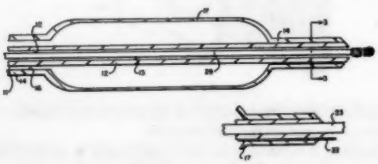
characterized by placing a cellular foam pad (12) in facing engagement with the adhesive film (16), and heating and diffusing the adhesive layer (16) into the foam pad (12) and fabric layer (14) respectively, and curing the diffused adhesive to secure the fabric layer (14) to the foam pad (12).

4,692,200

SELF-VENTING BALLOON DILATATION CATHETER AND METHOD

Philip E. Powell, Mountain View, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Division of Ser. No. 760,637, Jul. 30, 1985, Pat. No. 4,638,805.
This application Sep. 15, 1986, Ser. No. 907,108
Int. Cl.[4] B29C *27/00*
U.S. Cl. 156—289 **3 Claims**



1. In a method for fabricating a self-venting balloon dilatation catheter, providing a first tubular element having a lumen extending therethrough, providing a second tubular element having a lumen disposed therein, forming a balloon onto the second tubular element near the distal extremity of the second tubular element, placing the first tubular element within the second tubular element so that the second tubular element extends coaxially of the first tubular element and forming a flow passage open to ambient between the distal extremities of the first and second tubular elements and in communication with the interior of the balloon which has a size less than 0.001 inches to permit the escape of air from the interior of the balloon but inhibiting the escape of liquid from the interior of the balloon.

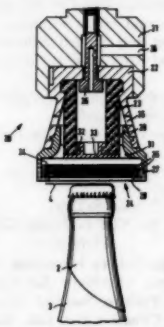
4,692,201

SMOOTHING AND PRESSING DOWN DEVICE IN LABELING MACHINES

Rudolf Zodrow, Dusseldorf, and Josef Tomashauser, Willich, both of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,440
Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417; Oct. 11, 1984, 3417283
Int. Cl.[4] B65C *3/22, 9/34*
U.S. Cl. 156—488 **7 Claims**

1. In a device for a labeling machine, for smoothing and pressing down a point of a blank of foil wrapped around neck and head portions of a bottle with the point projecting at the head portion, the device having a pot-like housing with a pressing down structure connected thereto and which housing is axially movable into a pressing down position wherein the pressing down structure acts on the bottle head portion, the improvement wherein the pressing down structure comprises a first axially compressible upper component and a second multilayer elastic component disposed below the first component



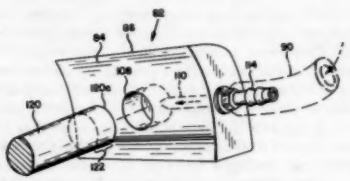
and separated from the first component, and further comprising means coactive with the second component to form a recess in a face of the pressing-down structure toward the bottle that is configured to embrace at least the head portion of the bottle on all sides subject to slight tension on the head portion when the housing is in the pressing-down position wherein the multilayer elastic component consists of several separate flat pressing-down disks.

4,692,202

MEANS FOR APPLYING LIQUID TO ROLLER IN LINE APPLICATOR

John L. Getz, Blachly, Oreg., assignor to Industrial Adhesives, Inc., Eugene, Oreg.

Filed Oct. 18, 1982, Ser. No. 434,722
Int. Cl.[4] B31F *5/04;* B32B *31/04*
U.S. Cl. 156—554 **10 Claims**



1. In a line applicator having a frame and a rotatable roller with a peripheral contacting surface for pressing an elongate line to a moving workpiece, means for applying liquid to the contacting surface of the roller comprising:

a shoe mounted on the frame having a curved face which is contoured to the curvature of the contacting surface of the roller and establishing sealed contact with the contacting surface, said surface of the roller moving under said face with rotation of the roller,

a liquid-holding well formed in said shoe communicating through an opening with said curved face of said shoe, with said opening completely encompassed by said curved face and the sealed contact established by the curved face, and

liquid-supply means connected to said well for supplying liquid thereto.

4,692,203

PROCESS FOR MAKING BETA-ZINC DIPHOSPHIDE MONOCRYSTALS (WHISKERS)

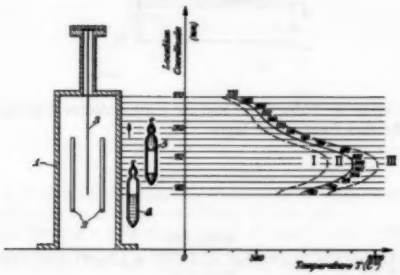
Thomas Betz, Wiehl-Bielstein; Hans-Georg von Schnering, Aidlingen, and Erich Schönherr, Leonberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 25, 1986, Ser. No. 899,941

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531949

Int. Cl.[4] C30B *23/00*

U.S. Cl. 156—610 **2 Claims**



1. A process for making β-zinc diphosphide monocrystals (β-ZnP_2) having a diameter of at least 7 mm which comprises: filling a quartz ampoule having a constriction formed in the upper end portion up to 70–90% its volume with polycrystalline β-ZnP_2; sealing the ampoule; subliming the polycrystalline β-ZnP_2 followed by condensing the β-ZnP_2 from the gas phase into the upper ampoule portion to form monocrystalline β-ZnP_2 wherein the ampoule is conveyed in upright position at a velocity of 0.5–2.5 mm/day over a period of 24 to 120 days through a kiln in which the temperature gradient from below to above is defined by a lower inlet temperature of 580°–780° C., a mean maximum temperature of 800°–950° C. and an upper outlet temperature of 350°–400° C.; maintaining the quartz ampoule under an outer inert gas pressure of 20–60 bars while being conveyed through the heated kiln; crushing the ampoule coming from the furnace and recovering the β-ZnP_2 monocrystal.

4,692,204

METHOD OF PLANARIZING THE SURFACE OF A SEMICONDUCTOR DEVICE, IN WHICH SILICON NITRIDE IS USED AS ISOLATING MATERIAL

Raymond Fabien, Douvres la Delivrande, and Jean-Michel Decrouen, Argences, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,709

Claims priority, application France, Sep. 20, 1985, 85 13987

Int. Cl.[4] H01L *21/306, 21/318*

U.S. Cl. 156—626 **2 Claims**

1. In a method of planarizing the surface of a semiconductor device comprising a substrate carrying in relief on its surface at least one contact configuration cut out of a contact layer, which method comprises successively carrying out the following steps:

(a) depositing a silicon nitride layer having a thickness substantially equal to that of the contact layer,

(b) depositing a lacquer layer having a given thickness and then treating the layer, wherein the kind, the thickness and the treatment of the lacquer layer are such that the free surface of this layer is substantially flat,

(c) progressively attacking by plasma the lacquer layer until the farthest projecting parts of the silicon nitride layer are completely exposed in order that a new free surface is reproduced, whose flatness is an image of that of the free surface of the lacquer layer, the complete appearance of the farthest projecting parts of the nitride layer being detected by means of a device for recording the intensity variations of an emitted jet of nitrogen, and

(d) attacking simultaneously, also by plasma, the silicon nitride layer and the remaining lacquer until the contact configuration appears completely; the improvement comprising choosing the conditions of attack during the step of simultaneously attacking the silicon nitride layer and the remaining lacquer so that the rate of attack of the lacquer is higher than the rate of attack of the silicon nitride so that the lacquer is completely removed before the appearance of the contact configuration, in order to detect with increased sensitivity by means of the recording device the complete appearance of the contact configuration.

4,692,205

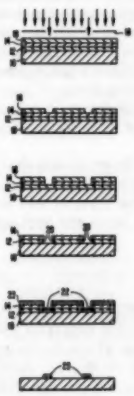
SILICON-CONTAINING POLYIMIDES AS OXYGEN ETCH STOP AND DUAL DIELECTRIC COATINGS

Krishna G. Sachdev; Ranee W. Kwong; Mani R. Gupta, all of Wappingers Falls; Mark S. Chace, Poughkeepsie, and Harbans S. Sachdev, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,893

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **B29C** *37/00*

U.S. Cl. 156—643 **14 Claims**



1. A method for depositing metal conductors on a substrate comprising the following steps:

providing a substrate;

depositing a lift-off polymer layer on the substrate;

depositing a layer of silicon-containing polyimide on the lift-off layer;

depositing a radiation sensitive layer on the silicon-containing polyimide layer;

imagewise exposing the radiation sensitive layer to radiation;

developing the imagewise exposed radiation sensitive layer;

etching the silicon-containing polyimide layer using the developed radiation sensitive layer as an etch mask;

etching the lift-off layer using the silicon-containing polyimide layer as an oxygen etch mask;

blanket depositing a layer of metal on the silicon-containing polyimide layer and exposed substrate;

removing the lift-off layer, the silicon-containing polyimide layer and overlying metal layer, leaving the metal conductors on the substrate.

4,692,206

METHOD FOR PRODUCING A SEMICONDUCTOR LASER DEVICE HAVING A BURIED HETEROSTRUCTURE

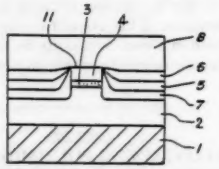
Shinji Kaneiwa; Haruhisa Takiguchi, both of Nara; Toshihiko Yoshida, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1986, Ser. No. 830,857

Claims priority, application Japan, Feb. 19, 1985, 60-33601

Int. Cl.⁴ H01S *3/18*

U.S. Cl. 156—649 **1 Claim**



1. A method for the production of semiconductor laser devices comprising:

growing a multi-layered crystal structure, containing an active layer for laser oscillation, on a p-substrate,

etching said multi-layered crystal structure to form a striped mesa-portion,

disposing a first layer of a first conductivity type over the entirety of an upper face of said multi-layer structure with the exception of an upper face of said striped mesa-portion, said first layer surrounding both sides of said striped mesa-portion to form a heterojunction at each of both side faces of said active layer;

disposing a second layer of a second conductivity type, opposite to said first conductivity type, over said first layer;

disposing a third layer of said first conductivity type over said second layer; and

disposing a burying layer of said second conductivity type over said third layer and said upper face of said striped mesa-portion.

4,692,207

PROCESS FOR THE PRODUCTION OF AN INTEGRATED LASER-PHOTODETECTOR STRUCTURE

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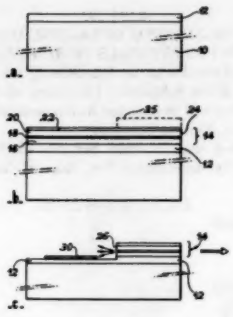
Filed Oct. 14, 1986, Ser. No. 917,860

Claims priority, application France, Oct. 14, 1985, 85 15217

Int. Cl.⁴ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—649 **5 Claims**

1. A process for producing an integrated laser-photodetector structure, wherein on a substrate are deposited a buffer layer, followed by a double heterostructure having a first confinement layer, an active layer and a second confinement layer; part of the double heterostructure is etched to produce an uncleaved face serving as a reflecting face for the laser; a photodetector is produced in the vicinity of the laser and on the side of the uncleaved face, wherein in order to produce the photodetector, part of the double heterostructure is etched at



least up to the buffer layer and the photodetector is produced on the thus freed buffer layer.

4,692,208

METHOD OF MANUFACTURING A LIGHT-EMITTING DEVICE

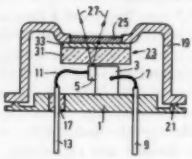
Giok D. Khoe, and Henricus M. De Vrieze, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1984, Ser. No. 654,834

Claims priority, application Netherlands, Sep. 28, 1983, 8303316

Int. Cl.⁴ B44C *1/22*; H01L *21/00*

U.S. Cl. 156—659.1 **2 Claims**

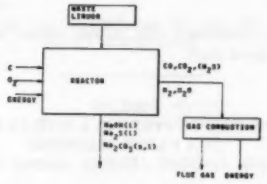


1. A method of manufacturing a light-emitting device in which a cap comprising a flat, transparent window on a support which supports a light-emitting semiconductor device, said cap being hermetically sealed to the support and said window being provided with a lens, said method comprising the steps of forming the window and the lens by providing a transparent multiple-layer plate in the cap at the area where said window is to be formed, the innermost layer of said plate which faces the semiconductor device being made of a material having a higher refractive index than that of the outermost layer, providing a layer of photosensitive lacquer on the outer side of the plate after connecting the cap to the support, then exposing a part of the layer of lacquer to light emitted by the semiconductor device and the developing said exposed layer part, so that only the exposed part which is situated opposite the semiconductor device remains, then heating said exposed part to the melting point to form a droplet of lacquer, then removing an outer layer of the plate and the droplet of lacquer by a non-selective etching method to form the lens opposite the semiconductor device and a flat window surrounding the lens at the same time.

4,692,209
RECOVERY OF CHEMICALS FROM PULP WASTE LIQUOR

Sven Santén, Hofors; Ragnar Bernhard, and Sven-Erik Malmeblad, both of Falun, all of Sweden, assignors to SKF Steel Engineering AB, Hofors and Stora Kopparbergs Bergslags AB, Falun, both of, Sweden

Continuation of Ser. No. 597,396, Apr. 6, 1984, Pat. No. 4,601,786. This application May 27, 1986, Ser. No. 866,660
Claims priority, application Sweden, Apr. 21, 1983, 8302245
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] D21C *11/12, 11/00*
U.S. Cl. 162—30.1 **9 Claims**

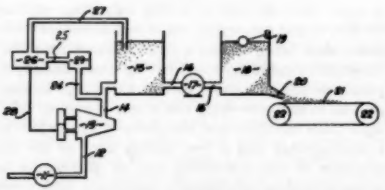


1. A method of recovering chemicals from waste liquor of wood pulp production, comprising in combination:
(a) feeding a pulp waste liquor of organic and inorganic constituents into a reaction zone of a reactor;
(b) heating the pulp waste liquor by supplying thermal energy, independent of combustion, for raising the temperature of the reaction zone independently of the oxidation level in the reactor zone such that the pulp waste liquor is substantially completely vaporized and converted in the reaction zone to a product mixture consisting essentially of sodium sulfide, sodium hydroxide, monatomic sodium, hydrogen, and carbon monoxide;
(c) cooling the product mixture in a cooling zone of the reactor;
(d) withdrawing the inorganic constituents of the pulp waste liquor as a white liquor melt or solution; and
(e) withdrawing the organic constituents as a combustible synthesis gas of hydrogen and carbon monoxide such that the organic constituents can be used to power a separate steam generator.

4,692,210
METHOD AND APPARATUS FOR MEASURING THE DISTRIBUTION OF FIBER WIDTHS AND ADJUSTING THE REFINING OF FIBROUS STOCK

Gilbert Forrester, 10/62 Alexandra Street, Hunters Hill, New South Wales, 2110, Australia

Filed Oct. 21, 1985, Ser. No. 789,783
Claims priority, application Australia, Oct. 25, 1984, PG7821
Int. Cl.[4] D21D *1/20;* **G01N** *15/02*
U.S. Cl. 162—49 **6 Claims**



1. A method of making paper of a selected quality from a type of fibrous stock, said method comprising the steps of refining the stock, analysing the refined stock to produce a measurement of the distribution of fibre widths over a selected range of fibre widths, comparing said measurement with a reference measurement of the distribution of fibre widths over said selected range of fibre widths obtained from a prior analysis of the same type of stock refined to a degree known to produce paper of said selected quality, and adjusting the refining of the stock to produce a stock the analysis of which produces a measurement of the distribution of fibre widths substantially the same as said reference measurement.

6. An apparatus for making paper of a selected quality from a type of fibrous stock, said apparatus comprising adjustable refining means to produce refined stock, a fibre fineness distribution analyser to produce a measurement of the distribution of fibre widths over a selected range of fibre widths in a sample of the refined stock, storage means to store a reference measurement of the distribution of fibre widths over said selected range of fibre widths obtained from a prior analysis of the same type of stock refined to a degree known to produce paper of said selected quality, means to compare said measurement with said reference measurement, and means responsive to the difference between said measurement and said reference measurement to adjust the refining means to produce a stock the analysis of which produces a measurement of the dstribution of fibre widths substantially the same as said reference measurement.

4,692,211
HIGH STRENGTH, CELLULOSIC-GEL-CONTAINING KRAFT PAPER AND PROCESS FOR MAKING THE SAME

James R. Roberts, Palatine, Ill., assignor to Eucatex S.A. Industria é Comercio of Sao Paulo, Sao Paulo, Brazil

Continuation of Ser. No. 661,977, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 417,874, Sep. 14, 1982, abandoned. This application May 23, 1986, Ser. No. 868,881
Int. Cl.[4] D21H *5/12, 3/20*
U.S. Cl. 162—147 **6 Claims**

1. The process of making high strength kraft paper which comprises:
(a) mechanically refining kraft paper-making pulp to a freeness value of about CSF 500–800;
(b) forming a fluid mixture of from about 90 to about 99% of the resulting refined pulp and from about 1 to about 10% of hydrated cellulosic gel binder having a TAPPI drain time of at least 350 seconds, percent being expressed as percent by weight on a dry solids basis,
(c) the draft paper-making pulp comprising from about 40 to about 100% by weight virgin kraft pulp and from about 0 to about 60% by weight, dry weight basis, short fibered hardwood papermaking pulp or short fibered reclaim papermaking pulp,
(d) running the fluid mixture into a felted sheet and
(e) pressing and drying the sheet to form the kraft paper product.

4,692,212
KRAFT LINERBOARD BY DENSIFICATION AND HEAT TREATMENT

Roy S. Swenson, Ringwood, N.J.; Donald M. MacDonald, Monroe, N.Y.; Michael Ring, Warwick, N.Y., and Jasper H. Field, Goshen, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Aug. 23, 1985, Ser. No. 768,776
Int. Cl.[4] D21F *11/00*
U.S. Cl. 162—206 **11 Claims**

1. A method of maximizing the folding endurance of linerboard produced from unbleached kraft pulp while improving its wet strength by heat treatment, comprising the steps of
forming a wet web of cellulose fibers from an aqueous suspension of fibers; then, without first drying the web,
press drying said wet web, by compressing it sufficiently to produce a product having a density of at least 700 kg/m^3 and drying the product until its water content by weight is less than 10%, and then
heat treating the product at an internal temperature of at

least 420° F. (216° C.) for a time sufficient to increase the wet strength thereof.

4,692,213

ADJUSTMENT DEVICE FOR A LIP OF A HEADBOX SLICE

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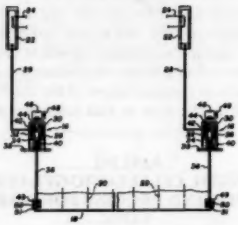
Continuation-in-part of Ser. No. 363,307, Jun. 25, 1984, abandoned. This application Jan. 8, 1985, Ser. No. 689,650

Int. Cl.[4] D21F *1/02, 1/06*

U.S. Cl. 162—259 **7 Claims**



1. A control for a lip of a head box slice, the control comprising:

a first vessel;

an incompressible liquid in the first vessel;

a heating element within the first vessel to vary the temperature of the liquid in a controllable manner within any range whose upper limit is below the boiling point of said incompressible liquid;

a second vessel able to expand;

an incompressible fluid in the second vessel;

a passageway communicating between the first vessel and the second vessel;

a member movable by the second vessel and attached at its end remote from the second vessel to the lip of the head box slice whereby heating of the incompressible liquid in the first vessel causes expansion of that liquid to pass along the passageway into the second vessel to move the member in a direction toward the lip, and whereby cooling of the incompressible liquid in the first vessel causes liquid from the second vessel to flow into the passageway to move the member in a direction away from the lip.

4,692,214

APPARATUS FOR PRODUCING MECHANICAL PULP WITH A REFINER HAVING ITS DRIVE SHAFT CONNECTED TO A STEAM TURBINE OUTPUT SHAFT

Bengt Nilsson, Skognall, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Oct. 29, 1984, Ser. No. 665,910

Int. Cl.[4] D21C *11/06;* **D21D** *1/00*

U.S. Cl. 162—261 **14 Claims**

1. Apparatus for producing mechanical pulp comprising:

a refiner having a drive shaft operatively connected to at least one rotatable refining element;

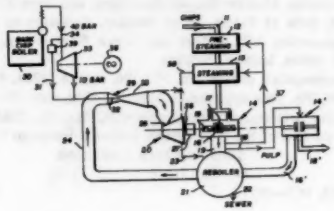
separating means for separating steam from refined material;

a process steam discharge means for discharging process steam from said separating means;

a pulp discharge means for discharging refined material from said separating means;

a steam turbine having a steam input and a rotating output shaft;

means for connecting said process steam discharge means to said steam turbine input, comprising reboiling means; and



means for connecting said turbine output shaft and said refiner drive shaft.

4,692,215

APPARATUS FOR CONVEYING A WEB LEAD-IN STRIP IN A PAPER MACHINE

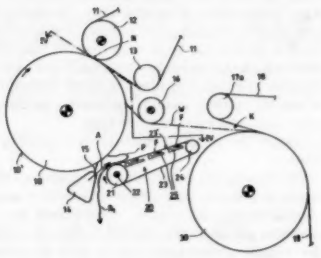
Reima Kerttula, Jyväskylä , Finland, assignor to Valmet Oy, Finland

Filed Jul. 2, 1985, Ser. No. 751,014

Claims priority, application Finland, Jul. 5, 1984, 842711

Int. Cl.[4] D21F *1/42*

U.S. Cl. 162—289 **10 Claims**



1. Apparatus for conveying a reduced-width lead-in strip of a full width web in a paper machine, comprising:

a conveyor belt arranged in a loop around at least one reversing roll and having a conveying run on which the lead-in strip is conveyed, said conveyor belt being formed of a fabric which is pervious to air; and

means situated within said loop of said conveyor belt for creating a dynamic vacuum on said conveying run of said conveyor belt so that the web lead-in strip adheres thereto, said vacuum creating means comprising air jet equipment including a plurality of guide plates situated within said belt loop arranged consecutively with respect to each other proximate to and extending substantially parallel to said conveying run of said conveyor belt, each guide plate being spaced a short distance from the next consecutive guide plate and having a substantially planar guide surface proximate to and extending substantially parallel to said conveying run of said conveyor belt forming a space therebetween, said planar guide surface having a leading edge and a free trailing edge in the running direction of said conveying run, air distributing header means extending substantially tranversely with respect to the running direction of said conveying run and situated substantially at said leading edge of said guide surface, and air jet discharge means formed in said air distributing header means for directing air jets over at least a portion of the length of said guide plate substantially parallel

thereto within said space between said guide plate and said conveying run of said conveyor belt; and

means for adjustably mounting at least one of said plurality of guide plates with respect to said conveying run of said conveyor belt so that the distance between said guide plate and said conveying run can be varied whereby the distribution of pressure in the running direction of said conveying run can be adjusted.

4,692,216

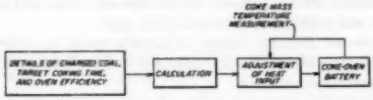
METHOD FOR CONTROLLING HEAT INPUT INTO A COKE OVEN

Jon L. Polansky; Douglas N. Rice, both of Penn Hills Township, Allegheny County; William J. Tomcanin, Penn Township, Westmoreland County, all of Pa., and Timothy B. Cribbs, Baytown, Tex., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 24, 1983, Ser. No. 544,925

Int. Cl.[4] C01B *47/00*

U.S. Cl. 201—1 **20 Claims**


COKE MASS TEMPERATURE MEASUREMENT
DETAILS OF CHARGED COAL, TARGET COKING TIME, AND OVEN EFFICIENCY
CALCULATION
ADJUSTMENT OF HEAT INPUT
COKE-OVEN BATTERY

1. Method of controlling heat input into a coke oven to obtain a desired temperature of the coke mass of said oven at the time of pushing comprising:

(1) determine the moisture content and heat of carbonization of a sample of coal scheduled for transfer into said oven;

(2) determine a coal mass, a target coking time, and an efficiency for said oven;

(3) calculate the heat requirement and temperature of the coke mass during the coking operation of said coke oven based upon said coal moisture, said heat of carbonization, said coal mass, said target coking time, and said efficiency;

(4) determine the temperature of said coke mass during the coking operation;

(5) compare the temperature determined from step 4 with the calculated temperature based upon the calculation of step (3);

(6) analyze any deviations noted in step (5) to obtain a more accurate heat requirement for said oven, and

(7) vary the heat input into said oven in accordance with said more accurate heat requirement.

4,692,217

READJUSTMENT DEVICE FOR COKE OVEN BATTERIES

Otto Lemke, Recklinghausen, and Manfred Krause, Herten-Langenbochum, both of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

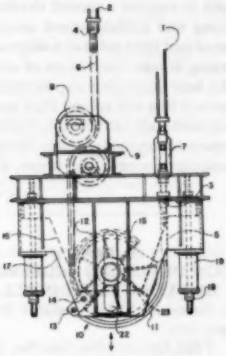
Filed Jul. 29, 1985, Ser. No. 760,314

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427991

Int. Cl.[4] C10B *21/10, 21/14*

U.S. Cl. 202—151 **13 Claims**

1. A device for moving two linkages in opposite directions, each linkage being adapted for connection to its own set of shutoff circuit members of individual coke ovens of a coke oven battery, the device comprising two linkages, a guide pulley assembly having an axis and two pulley segments which are connected to each other, said pulley segments being mounted to each other for common rotation around said axis, each pulley segment including a curved arc portion having a radius from said axis which is different from the radius of the curved arc portion of the other pulley segment, each arc portion having a circumferential fastening point, support means mounting said guide pulley assembly for rotation of said pulley segments around said axis, two flexible connecting members, each flexible connecting member having one end connected to one of said fastening points and an opposite end, each flexible connecting member being engagable against and trained around said curved arc portion of its pulley segment in opposite directions around said axis with said opposite ends of said connecting members being movable by different amounts and



in opposite directions with rotation of said pulley segments due to the difference in radii of said curved arc portions, one of the linkages being connected to said opposite end of one flexible connecting member and the other of the linkages being connected to said opposite end of the other flexible connecting member so that rotation of said pulley segment around said axis caused the linkages to move in opposite directions and by different stroke lengths.

4,692,218

PROCESS FOR PRODUCING ETHANOL

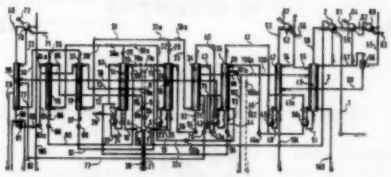
Heinz Houben, Monchen-Gladbach; Hans U. Petzoldt, Leverkusen, and Joachim Stegemann, Hürth-Hermülheim, all of Fed. Rep. of Germany, assignors to Fried, Krupp GmbH, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,785

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208743; Feb. 3, 1983, 3303571

Int. Cl.[4] B01D *3/36*; C07C *29/80*

U.S. Cl. 203—19 **17 Claims**



1. A process for the production of ethanol, said process requiring the input of a predetermined quantity of process heat and comprising the steps of:

(a) admitting a first stream of fermented mash containing about 1.5 to about 15.0 percent by volume of alcohol into a first fluid path having spaced first and second zones;

(b) distilling, without reflux, said first mash stream in said first zone to recover a first alcohol-enriched stream;

(c) rectifying, with reflux, at least part of said first alcohol-enriched stream in said second zone to recover a first alcohol-rich product;

(d) admitting a second stream of fermented mash containing about 1.5 to about 15.0 percent by volume of alcohol into

a second fluid path having spaced first and second zones distinct from said first and second zones of said first fluid path;

(e) distilling, without reflux, said second mash stream in said first zone of said second fluid path to recover a second alcohol-enriched stream;

(f) rectifying, with reflux, at least part of said second alcohol-enriched stream in said second zone of said second fluid path to recover a second alcohol-rich product;

(g) admitting said predetermined quantity of process heat into one of said fluid paths at a single location thereof; and

(h) conveying at least one stream of said heat along a third path, the heat conveying step including transferring heat between said first and second fluid paths in such a manner that said third path includes all of said zones and said one heat stream successively passes through said first zones, and thereafter successively passes through said second zones.

4,692,219

SEPARATION OF FORMIC ACID FROM ACETIC ACID BY EXTRACTIVE DISTILLATION

Lloyd Berg, Bozeman, Mont., assignor to Celanese Chemical Co., Pampa, Tex.

Filed Dec. 3, 1986, Ser. No. 937,401
Int. Cl.[4] B01D *3/40*; C07C *53/02*
U.S. Cl. 203—51 **17 Claims**

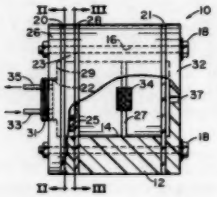
1. A method for recovering formic acid from a mixture comprising formic acid and acetic acid which comprises distilling a mixture comprising formic acid and acetic acid in a rectification column in the presence of about one to two parts of an extractive agent per part of formic acid - acetic acid mixture, recovering the formic acid as overhead product, obtaining the acetic acid and the extractive agent from the stillpot, separating the acetic acid from the extractive agent by distillation in another column, the extractive agent comprises at least a mono carboxylic acid containing from five to ten carbon atoms.

4,692,220

ELECTROCHEMICAL DETERMINATION OF FORMALDEHYDE

RaeAnn M. Auel, Westminster; Joseph D. Jolson, and David A. Stewart, both of Baltimore, all of Md., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 24, 1986, Ser. No. 822,488
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **3 Claims**



1. A method of electrochemically determining formaldehyde in a gas comprising exposing the gas to an iridium electrode in contact with an electrolyte,

maintaining the electrode at a fixed potential of from about 1.1 to 1.5 volts with respect to the reversible hydrogen couple in the electrolyte, whereby formaldehyde is oxidized,

and measuring the current flowing through the electrode.

4,692,221

IN-SITU DENDRITIC TREATMENT OF ELECTRODEPOSITED FOIL

Arvind Parthasarathi, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 22, 1986, Ser. No. 944,776
Int. Cl.[4] C25D *1/04*
U.S. Cl. 204—13 **17 Claims**

1. An apparatus for forming in-situ surface treated metal foil, said apparatus comprising:

a cell containing an electrolyte having a concentration of metal values to be plated;

a moving cathode at least partially immersed in said electrolyte;

means for electroforming metal foil on said cathode in a first zone and for applying a surface treatment comprising a plurality of dendritic structures to said foil in a second zone;

said electroforming and surface treatment applying means comprising an anode having a first portion spaced a first distance from said cathode and defining said first zone and a second portion spaced a second distance from said cathode and defining said second zone; and

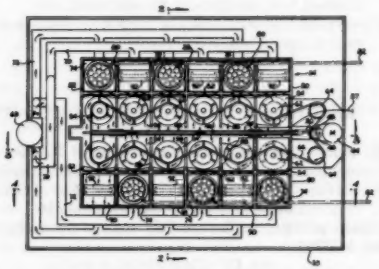
said second distance being sufficiently small to create a localized current density sufficient to form said dendritic structures on said foil.

4,692,222

ELECTROPLATING METHOD AND APPARATUS FOR ELECTROPLATING HIGH ASPECT RATIO THRU-HOLES

Peter P. Pellegrino, 216 Edgewood La., Apple Valley, Minn. 55124, and Damian Pellegrino, 17029 Harbor Bluff Cir., Huntington Beach, Calif. 92649

Division of Ser. No. 672,601, Nov. 19, 1984, Pat. No. 4,587,000.
This application Feb. 21, 1986, Ser. No. 832,057
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 **4 Claims**



1. A method of plating through holes in a printed circuit board comprising the steps of

(a) emersing the printed circuit board containing the through holes in the placing solution;

(b) mechanically agitating the plating solution adjacent the through holes by repetitive movement of said circuit board back and forth in a plane substantially coincident with the plane of the circuit board; and

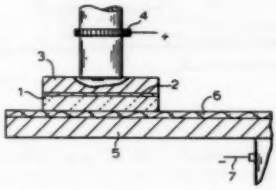
(c) encouraging flow of the agitated plating solution throug the through holes to provide fresh plating solution to inner surfaces through said holes.

4,692,223

PROCESS FOR POLISHING SILICON WAFERS

Ingolf Lampert, and Herbert Jacob, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed May 5, 1986, Ser. No. 859,636
Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517665
Int. Cl.[4] B24B *1/00*
U.S. Cl. 204—34.5 13 Claims



1. In a process for polishing silicon wafer surfaces, the improvement comprising the steps of:

initially polishing the wafer surface in a conventional manner under alkaline conditions until a high quality of said polished surface is achieved; and

thereafter, without interruption of the polishing, continuing and completing the polishing operation under oxidizing conditions by adding an oxidizing agent or anodic oxidation, thereby producing a film of silicon dioxide on the polished silicon wafer surface.

4,692,224

VOLATILE ANODIZING ELECTROLYTES FOR TANTALUM

Walter J. Bernard, and Steven M. Florio, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 11, 1986, Ser. No. 895,062
Int. Cl.[4] C25D *11/00*
U.S. Cl. 204—56.1 5 Claims

1. An anodized film formed over the voltage range of 100 V to 350 V throughout the pores of tantalum pellets suspended from an aluminum alloy bar in a volatile electrolyte comprising an organic carboxylic acid selected from the group of acetic and salicylic acids, said electrolyte during anodization provides concentrated free acid within said pores of said pellets of a conductivity that supports anodization over said voltage range, said acid being cleanly volatile from said pores at 200° C. or less.

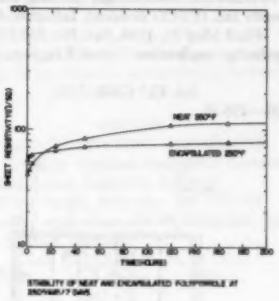
4,692,225

METHOD OF STABILIZING CONDUCTIVE POLYMERS

Edward F. Witucki, Van Nuys; Leslie F. Warren, Jr., Camarillo, and Paul R. Newman, Newbury Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 8, 1986, Ser. No. 883,253
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—59 R 20 Claims

1. A process for stabilizing an electrically conductive polymer which comprises encapsulating a conductive polymer selected from the group consisting of polypyrrole and polyaniline with a resin selected from the group consisting of epoxy, polyixide and bis-maleimide resins.



4,692,226

PROCESS TO MANUFACTURE GLYOXYLIC ACID BY ELECTROCHEMICAL REDUCTION OF OXALIC ACID

Isabelle Gimenez; Marie-Jeanne Barbier, both of Grenoble; Suzanne Maximovitch, Meylan, and Yani Christidis, Paris, all of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Aug. 29, 1986, Ser. No. 901,792
Claims priority, application France, Sep. 10, 1985, 85 13385
Int. Cl.[4] C07B *29/06*; C07C *51/40*
U.S. Cl. 204—73 R 7 Claims

1. A process for manufacturing glyoxylic acid by electrochemical reduction of oxalic acid at a temperature of from 0° to 30° C. in an electrolysis apparatus comprising:

at least one anode compartment containing an anode and an anolyte, the anolyte comprising an aqueous acid solution;

at least one cathode compartment containing a cathode and a catholyte, the catholyte comprising an aqueous solution of oxalic acid; and

at least one separator between the two compartments;

wherein the anode consists of a solid conductor selected from the group consisting of compact graphite, vitreous carbon, titanium, gold, and platinum, the conductor being coated before use with an electrolytic deposit of a uniform layer of lead dioxide.

4,692,227

OXIDATION OF ORGANIC COMPOUNDS USING THALLIUM IONS

Robert M. Spotnitz, Baltimore, and Robert P. Kreh, Jessup, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

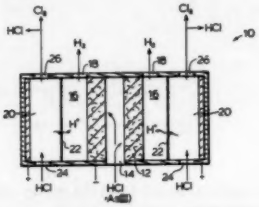
Filed Dec. 1, 1986, Ser. No. 936,521
Int. Cl.[4] C25B *3/02*
U.S. Cl. 204—78 31 Claims

1. A process for oxidizing organic compounds comprising contacting an organic compound having an index of hydrogen deficiency greater than zero with a solution containing thallic organosulfonate salt in the presence of an excess of the corresponding free organosulfonic acid, said organosulfonic acid having the general formula RSO_3H wherein R represents methyl, trifluoromethyl, benzyl, tolyl and mitures thereof and said solution being substantially free of extraneous anions of inorganic acids and having at least 0.1 molar thallium concentration; and separating and recovering the oxidized product from the solution to yield a spent solution rich in thallous salts.

4,692,228
REMOVAL OF ARSENIC FROM ACIDS

Zbigniew Twardowski, Mississauga, Canada, assignor to Teneco Canada Inc. (ERCO division), Islington, Canada

Filed May 21, 1986, Ser. No. 865,457
Claims priority, application United Kingdom, Jul. 23, 1985, 8518601
Int. Cl.[4] C25R 1/00
U.S. Cl. 204—105 R 16 Claims

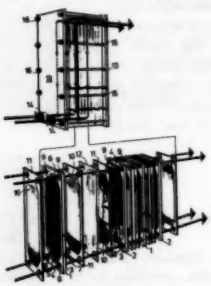


1. A method for removal of dissolved arsenic (III) ions from hydrochloric acid, which comprises cathodically reducing the dissolved arsenic (III) ions to metallic arsenic in an electrolytic cell having a large surface area cathode with interstices through which said arsenic-contaminated hydrochloric acid flows during said cathodic reduction, said interstices defining a three-dimensional electrolyte-contacting surface, and depositing the arsenic metal so produced on said cathode.

4,692,229
ELECTRODE CHAMBER UNIT FOR AN ELECTRO-CHEMICAL CELL HAVING A POROUS PERCOLATION ELECTRODE

Ake Bjäreklint, Vallentuna, and Daniel Simonsson, Täby, both of Sweden, assignors to ElectroCell AB, Åkersberga, Sweden

Filed Jun. 15, 1984, Ser. No. 621,101
Claims priority, application Sweden, Jun. 17, 1983, 8303494
Int. Cl.[4] C02F 1/46; C25B 9/00, 11/03, 11/12
U.S. Cl. 204—151 21 Claims

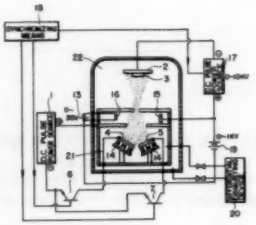


21. A method for purifying water comprising the steps of:
providing an electrochemical cell including at least one porous percolation electrode in the form of a bed of electrically conductive particles and which includes at least one thin, substantially flat frame, which frame defines a central opening that is filled with the electrically conductive particles so that these form a porous bed, the particles being kept in place in the central opening of the frame by sufficiently dense separators which are arranged to cover the central opening on either side of the frame to form an electrode chamber of substantially the same thinness as the frame, the frame provided with at least one first hole for supplying and at least one second hole for discharging electrolyte, said holes being in communication via inlet and outlet channels respectively with the central opening of the frame;
supplying a flow water to said first hole; and
during said water supplying step, supplying electric current to an electrode element located within said electrode chamber and in electrical contact with said porous bed so that electric current is supplied to said conductive particles while said electrode element is immersed in the supplied water, said electric current and said water flow being directed in a crossflow pattern in relation to each other.

4,692,230
THIN FILM FORMING METHOD THROUGH SPUTTERING AND SPUTTERING DEVICE

Masayasu Nihei, Hitachi; Masateru Suwa, Ibaraki, and Mitsuo Chigasaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1986, Ser. No. 852,314
Claims priority, application Japan, Apr. 15, 1985, 60-79758
Int. Cl.[4] C23C 14/34
U.S. Cl. 204—192.31 9 Claims



1. A method for forming film, comprising the steps of:
preparing a plurality of targets formed of different materials;
switching electric powers from one target to another to sputter said targets so as to deposit produced particles on a substrate;
ionizing the particles produced from the sputtering and thereafter depositing the ionized particles on the substrate;
accelerating the ionized particles and thereafter depositing them on a substrate so as to form said film; and
controlling an accelerating voltage of said ionized particles in synchronism with a switching frequency of said electric powers supplied to the targets.

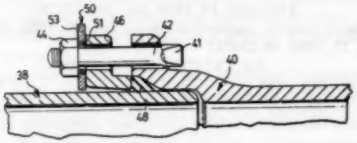
7. A sputtering device comprising:
at least two targets formed of different materials;
a sputtering power source for supplying electric powers to said targets;
switching means for switching the electric powers from one of said at least two targets to another of said at least two targets at a switching frequency;
ionizing means for ionizing particles sputtered by means of said sputtering power source;
ion accelerating means for accelerating said ionized particles with an accelerating voltage; and
controlling means for controlling said accelerating voltage in synchronism with said switching frequency.

4,692,231

APPARATUS FOR CATHODIC PROTECTION OF METAL PIPING

Henri S. St. Onge, 75 Nugget Avenue, Scarborough, Ontario M1S 3B1, Canada

Filed Feb. 6, 1985, Ser. No. 698,908
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—197 **10 Claims**



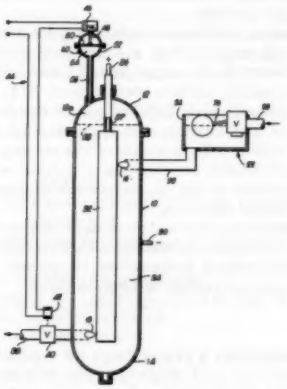
1. A length of iron pipe for use in a piping system subject to corrosion, said iron pipe having a bellmouth connection at one end thereof and a spigot connection at the opposite end for insertion in the bellmouth connection of a similar length of pipe, said bellmouth having a flat annular surface about the end thereof to which a sacrificial ring anode is mechanically secured in a manner to be in electrical conduction with said iron pipe, said sacrificial ring anode being made of a high grade zinc and having a substantial area of contact with said flat annular surface, said flat annular surface and said ring anode being of essentially the same internal and external diameters.

4,692,232

APPARATUS FOR INCREASING THE RESIDENCE TIME OF WASTE LIQUIDS IN AN ELECTRIC TREATER

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66026

Filed Aug. 5, 1985, Ser. No. 762,210
Int. Cl.[4] C25B *9/00*
U.S. Cl. 204—278 **3 Claims**



1. In a treater for exposing industrial waste water to an electric field to promote flocculation of solids therefrom, the improvement comprising:

means defining a pair of spaced electrodes having a treating region therebetween;

means for connecting said electrodes across a source of electrical potential to oppositely charge the electrodes and establish said electric field within said treating region;

inlet means for introducing waste water to said region for treatment by electrolysis, causing the formation of gas;

outlet means for discharging treated water from said region; and

flow control means operably associated with said outlet means for regulating the residence time of water within said region,

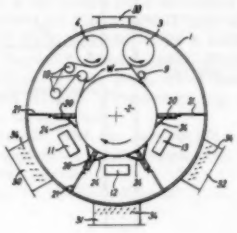
said control means having a shut-off valve and mechanism for opening and closing said valve in response to the generation of gas from the water during treatment thereof.

4,692,233

VACUUM COATING APPARATUS

Frank Casey, Rochdale, England, assignor to General Engineering Radcliffe Limited, Radcliffe, England

Filed Apr. 5, 1984, Ser. No. 597,123
Claims priority, application United Kingdom, Apr. 6, 1983, 8309324; Sep. 9, 1983, 8324192
Int. Cl.[4] C23C *14/56, 14/36*
U.S. Cl. 204—298 **7 Claims**



1. A vacuum coating apparatus for coating a length of sheet material comprising: a housing defining a vacuum chamber and having an interior wall and an axis; a transport cylinder having a central axis positioned within said housing; a plurality of radially extending peripherally spaced partitions dividing the chamber into at least three sub-chambers; each partition having a first part closely spaced from the transport cylinder and being in a fixed relationship to the position of the transport cylinder, a second part radially spaced from the first part, fixed to the interior wall and adapted to slide relative to the first part in the direction of the central axis of the transport cylinder, and sealing means interposed between the two partition parts; at least two treatment stations disposed in two respective sub-chambers; transporting means within the housing cooperating with the transport cylinder to transport a length of material past the treatment stations, said transport cylinder including a transport surface over which the sheet material passes, the transport surface defining at least one inner wall of each of said sub-chambers; and means for activating the treatment stations to treat sequentially the length of material as it passes the respective stations, one of the stations comprising a source of a coating substance which when activated coats the length of material as it passes that station.

4,692,234

ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

Randall A. Porter, and Larry E. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 9, 1986, Ser. No. 849,644
Int. Cl.[4] C10G *9/16*; C23C *18/12*
U.S. Cl. 208—48 AA **30 Claims**

1. A method for reducing the formation of coke on the metals which are contacted with a gaseous stream containing hydrocarbons in a thermal cracking process comprising the step of contacting said metals with an antifoulant selected from the group consisting of a composition comprising silicon and tin, a composition comprising silicon and antimony and a

composition comprising silicon, tin and antimony, wherein said silicon, tin and antimony are present in said composition in a form selected from the group consisting of elemental metals, organic compounds and inorganic compounds.

4,692,235

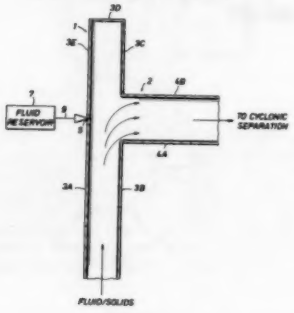
SELECTIVE PLACEMENT OF FLUID INJECTION IN A RISER REACTOR EQUIPPED WITH A HORIZONTAL TEE JOINT CONNECTION TO SUBSTANTIALLY REDUCE BACK PRESSURE IN THE RISER REACTOR

Wesley A. Parker, Houston; Donald E. Hardesty, Brookshire, and Jack E. Stanley, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 28, 1986, Ser. No. 867,663

Int. Cl.[4] B01J *8/18*

U.S. Cl. 208—113 **22 Claims**



1. An apparatus for passing combined phases of an admixture of a vapor phase and fine solid particles upward through a first passageway and forcing said combined phases to a second passageway positioned at a substantially right angle with respect to said first passageway which comprises:

(a) a first passageway comprising a vertical passageway having a diameter and being situated in a substantially vertical upright position, said first passageway having a plurality of side walls, an imperforate top, and a bottom portion, wherein said bottom portion of said first passageway includes an inlet means to permit entry into said first passageway of a combined fine solid particle-vapor phase stream;

(b) a second passageway comprising a relatively horizontal elongated passageway situated substantially perpendicular to said first passageway and interconnecting and communicating openly at one end with a first of said side walls at an upper portion of said passageway to define a tee joint interconnection wherein a first portion of said first passageway is situated below said second passageway and a second portion of said first passageway is situated above said second passageway, and wherein said second portion terminates at said imperforate top, and wherein said second passageway communicates with, at the other end, a solid particle-vaporous phase separation means; and

(c) a fluid inlet injection means selectively located juxtaposed or attached to a second of said side walls to inject fluid in a direction substantially perpendicular to the vertical axis of said first passageway and to project said fluid into said second passageway, wherein said select location of said fluid inlet injection means is below the uppermost interconnection of the first passageway and the second passageway and above the lowermost interconnection of the first passageway and the second passageway, and wherein said fluid injection at the selected situs acts to aid the volume of said fine solid particles transferred from said first passageway to said second passageway and acts to prevent the backflow of said fine solid particles from said upper portion of said first passageway to a portion of said first passageway located below said tee joint interconnection.

4,692,236

CATALYTIC CRACKING PROCESS FOR HEAVY OIL WITH MIXTURE OF ALUMINA AND ZEOLITE

Goro Sato; Masamitsu Ogata; Tatsuo Masuda, and Takanori Ida, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Inc., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,891

Claims priority, application Japan, Sep. 25, 1984, 59-199733; Nov. 27, 1984, 59-250787

Int. Cl.[4] C10G *11/05, 25/09*

U.S. Cl. 208—114 **11 Claims**

1. A catalytic cracking process for heavy oil containing metallic impurities, which comprises: contacting said heavy oil, under catalytic cracking conditions, with a catalyst composition consisting essentially of a physical admixture of (A) particles of a crystalline aluminosilicate zeolite dispersed in a siliceous matrix, and (B) particles of alumina, the weight ratio of (A)/(B) being in the range of from 75/25 to 25/75, said catalyst composition containing from 20 to 50% by weight of said zeolite, so that the metallic impurities in said heavy oil are preferentially captured by said alumina particles whereby to reduce the production of hydrogen and coke and increase the yield of gasoline.

4,692,237

PROCESS FOR THE REMOVAL OF SOLIDS FROM AN OIL

Edward C. Hsu, Bridgewater, N.J.; Philip Merchant, Jr., Houston, Tex.; Dean L. Smith, Jr., Mountainside, N.J.; Kevin P. Kelly, Houston, and Sylvia M. Lacy, Pearland, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 1, 1985, Ser. No. 718,134

Int. Cl.[4] C10G *29/20, 33/04*

U.S. Cl. 208—177 **6 Claims**

1. A process for reducing the particulate solids content of a hydrocarbon oil fraction comprising:

providing a hydrocarbon oil fraction containing less than 10 wt % water;

treating said hydrocarbon oil fraction with an agglomeration aid introduced as a water-in-oil emulsion wherein the water to oil ranges from 5:1 and 1:10 and wherein the resulting mixture contains from 10 to 1000 weight parts per million (WPPM) of said aid based on the total weight of said mixture, said agglomeration aid being a water soluble polyelectrolyte of Mw ranging from 0.5 million to 25,000,000 and forming a polymer-water particles suspended in said oil, said particle agglomerating solids contacted therewith;

removing substantial portions of the polymer-water particles with solids agglomerated thereon; and

recovering a hydrocarbon oil bottoms portion having a reduced content of filterable solids.

4,692,238

SOLVENT EXTRACTION OF ORGANIC OILS AND SOLVENT RECOVERY

William W. Bodle, Deerfield, and Paul B. Tarman, Elmhurst, both of Ill., assignors to Institute of Gas Tehnology, Chicago, Ill.

Filed Aug. 12, 1986, Ser. No. 895,724

Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—407 **22 Claims**

1. A process for solvent extraction of organic oils and residues in association with inorganic solids and solvent recovery comprising the steps of:

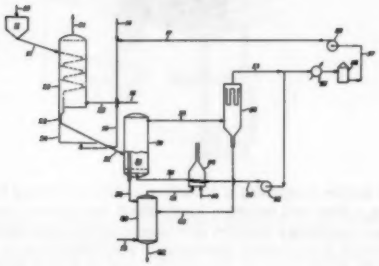
countercurrently contacting said solids with upflowing liquid organic solvent in a staged solvent extraction reactor;

withdrawing said liquid solvent having a substantial portion

of said organic oils and residues dissolved therein from said solvent extraction reactor, separating said organic oils and residues from said solvent, and recycling liquid solvent to said solvent extraction reactor;

withdrawing liquid solvent extracted solids having a substantially reduced portion of said organic oils and residues in association therewith and solvent associated therewith from said solvent extraction reactor and conveying said liquid solvent extracted solids and associated solvent to a fluidized bed solvent recovery contactor, said solids fluidized by fluidizing gas comprising superheated vapor of said solvent vaporizing an additional portion of said associated solvent;

discharging said fluidizing gas and additional vaporized solvent from said solids from said fluidized bed solvent recovery contactor and liquefying and recycling said solvent for utilization in said process;



withdrawing said solids containing residual solvent and organic oil from said fluidized bed solvent recovery contactor and conveying said solids containing residual solvent and organic oils to a solids/combustion gas contactor;

countercurrently contacting said solids in said solids/combustion gas contactor with an upwardly flowing combustion gas stream at ambient lower temperature than said solids, physically stripping solvent from said solids and heating said combustion gas, combusting said combustion gas comprising stripped solvent in a solvent vapor superheater for producing said superheated vaporized solvent; and

discharging spent solids having reduced residual solvent from said solids/combustion gas contactor.

4,692,239

METHOD OF RECOVERING HYDROCARBON FROM OIL SHALE

Robert H. Friedman, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,362

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] C10G *1/00*

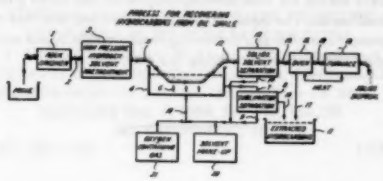
U.S. Cl. 208—430 **29 Claims**

1. A method for recovering hydrocarbons from oil shale comprising mineral rock and kerogen materials comprising:

(a) crushing the oil shale to a coarse texture including chunks of one inch or more;

(b) exposing the crushed oil shale to a hydrogen doning solvent including tetralin for at least 3 days sufficient to accomplish at least partial disistegration of the oil shale mineral;

(c) exposing the oil shale material to an oxidative environment comprising a free oxygen-containing gas at a temperature of at least 60° C. for sufficient time to cause oxidative scission of a portion of the kerogen which produces organic fragments removed from the kerogen, said oxidative environment also including a liquid solvent for the organic fragments;



(d) separating the solent and organic fragments from the residual solids; and

(e) separating the organic fragments from the solvent.

4,692,240

APPARATUS AND A METHOD FOR SEPARATING ONE SOLID COMPONENT FROM ANOTHER SOLID COMPONENT IN SUSPENSION IN A LIQUID

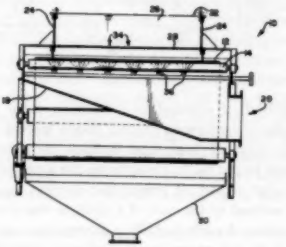
Ian M. Arbuthnot, Northcliff; Errol T. Amm, Bryanston, and Raymond J. Davidson, Victory Park, all of South Africa, assignors to Delkor Technik (Proprietory) Ltd. of Delkor House, Parktown, South Africa

Filed Jun. 26, 1985, Ser. No. 749,171

Claims priority, application South Africa, Jun. 27, 1984, 84/4920; Feb. 28, 1985, 85/1540

Int. Cl.[4] B07B *1/10, 1/50*

U.S. Cl. 209—254 **13 Claims**



1. A gravity operable separator for separating out a first solid component from a mixture thereof with a liquid and a second solid component which is of smaller average particle size than the first solid component, the first and second solid components being in suspension in the liquid and with the percentage by mass of the second solid component being substantially greater than that of the first solid component, which includes

an endless cloth which is foraminous and has foramen which are of a suitable size to permit the second solid component to pass therethrough and to impede the passage therethrough of the first solid component, a part of the cloth being substantially horizontal and defining an extended operative separating region;

a feed means for feeding the liquid and the solid components onto the cloth in a distributed and continuous manner directly onto a substantial portion of that part of the cloth that defines the operative separating region, the feed means including a feed box that has a floor plate with a number of distributed feed openings and which is spaced from the cloth;

a liquid collecting means for collecting liquid and material that has passed through the cloth, the liquid collecting means being located beneath that part of the cloth defining the operative separating region;

a first component removal and collecting means for removing material from the cloth and collecting it; and

a drive means for continuously displacing the cloth past the feed means, the liquid collecting means and the first component removal and collecting means whilst liquid and the solid components are being fed onto the cloth.

4,692,241

SEWAGE TREATMENT BIOLOGICAL ROTORS

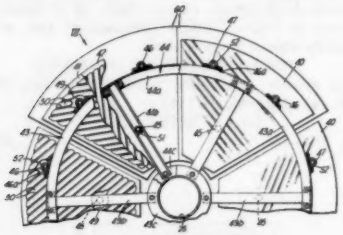
John L. Nicholson, Thame, United Kingdom, assignor to Klargester Environmental Engineering Ltd., Aylesbury, United Kingdom

Filed Dec. 12, 1985, Ser. No. 808,429

Claims priority, application United Kingdom, Dec. 18, 1984, 8431866; Jun. 11, 1985, 8514680

Int. Cl.[4] C02F *3/08*

U.S. Cl. 210—150 **9 Claims**



1. A method of assembling a biomass rotor from sector-shaped packs of preformed plastics sheets having (at least two) a triangular array of three rigid through-members penetrating all the sheets in the pack, comprising the steps of securing the packs between a pair of spider-like support assemblies each extending normal to the axis of a shaft to thereby constitute a coplanar pair and each including arranging a ring concentric with the shaft and extending radial arms inwardly from the ring towards the shaft, locating the radial arms in each pair of support assemblies in respective axial planes of the shaft, securing two rigid through members of each pack at each end to the respective rings of the pair, characterized by forming each of the radial arms as channel-shaped members with the channels in each coplanar pair opening towards one another to thereby confront each other and by locating ends of the remaining rigid through-member of each pack in the confronting channels of a respective axially coplanar pair of raidal arms.

4. A biomass rotor comprising a plurality of sector-shaped packs of preformed plastics sheets, each pack having three rigid through-members penetrating all the sheets in the pack, the packs being secured between a pair of spider-like support assemblies each extending normal to the axis of a shaft of the rotor to thereby constitute a coplanar pair, each support assembly including a ring concentric with the shaft and radial arms extending inwardly from the ring towards the shaft, the arms in each pair of support assemblies being located in respective axial planes of the shaft, two of the rigid through-members being secured at each end to the respective rings of the pair, characterized in that each radial arm is a channel-shaped member with the channels in each coplanar pair opening towards one another to thereby confront each other, the remaining rigid through-member of each pack having its ends located in the confronting channels of a respective axially coplanar pair of radial arms.

4,692,242

SCREEN COMPRISING A TRAVELLING ENDLESS SCREENING BAND

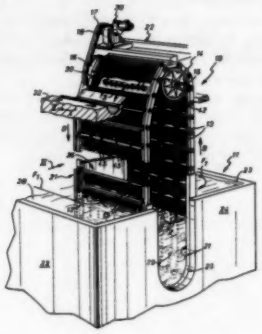
Philip Jackson, 15 Rue Las Cases, 75007 Paris, France

Filed Dec. 26, 1985, Ser. No. 813,672

Claims priority, application France, Dec. 28, 1984, 84 20004

Int. Cl.[4] B01D *33/04*

U.S. Cl. 210—160 **19 Claims**



1. A screen comprising a travelling endless screening band defining a loop and having a longitudinal direction of movement and including a plurality of screening panels connected to one another in succession substantially perpendicularly to the longitudinal direction of movement, each of said screening panels including a substantially plane chassis, and a screening element carried by said chassis, said screening elements forming relative to a general plane of said chassis part-cylindrical projections extending parallel to the longitudinal direction of movement, generatrices of the part-cylindrical projections being parallel to the longitudinal direction of movement, the improvement wherein the screen is adapted to filter water flowing from outside to inside the screen, and there are means for washing the screening band disposed inside the loop defined by said screening band in a position to preclude interference with movement of said screening band, said means for washing said screening band comprising a washing manifold spaced inwardly and beyond the path of movement of said chassis and lying generally perpendicular to the direction of movement, said washing manifold including a plurality of nozzles arranged in first and second rows staggered with respect to the direction of movement, a first plurality of said nozzles being directed at a first oblique angle relative to the general longitudinal plane of the screen and a second plurality of said nozzles being directed at a second oblique angle relative to said general longitudinal plane opposite the first oblique angle, whereby respective ones of said first and second pluralities of nozzles are in crossed relationship for washing respective surfaces of said projections.

4,692,243

COLUMN FOR LIQUID CHROMATOGRAPHY

Bedrich Porsch; Jaroslav Voslar, and Jaroslav Rosol, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia

Continuation of Ser. No. 662,695, Jun. 20, 1984, abandoned. This application Dec. 13, 1985, Ser. No. 808,234

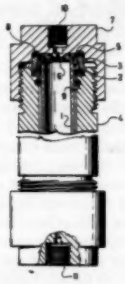
Claims priority, application Czechoslovakia, Jun. 24, 1983, 4677-83

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 **6 Claims**

1. Column for liquid chromatography consisting of a glass tube having an inner diameter of at least 5.8 mm and a wall thickness of at least 2.45 mm, said glass tube being placed inside a metallic tube, the glass tube and the metallic tube each having

a through bore, wherein the said metallic tube (4) has recesses in its inner wall at both ends, which recesses accommodate conic circumferential packings (2) from plastics, together with metallic conic tightening rings (3), and further consisting of front packings (5) from plastics, which have gauzes or porous disks (6) pressed into their recesses, and wherein the both packings are tightened with metallic terminal elements (7) screwed on the ends of tube (4), whereas the metallic terminal



elements (7) are provided, at sides adjacent to the front packings (5), with expansion slots (8), whereby the circumferential packing (2), tightening ring (3) and terminal element (7), at each respective end of the metallic tube (4), co-act to seal the glass tube through bore from the metallic tube through bore, said column being characterized in that it is capable of withstanding a pressure of up to 72 MPa without destruction of the glass tube.

4,692,244

DISPERSER FOR A FLOTATION SYSTEM

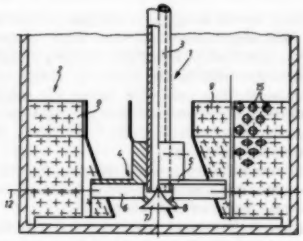
Armin Supp, Hamm, and Rainer Nebe, Mühlheim, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,599

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, 3400593

Int. Cl.[4] C02F *1/24*; B01F *3/04*

U.S. Cl. 210—219 **9 Claims**



1. In a flotation disperser having a rotatable agitator rotor and a plurality of stabilizer plates provided with holes encircling the rotor, each of said stabilizer plates having an upper vertical portion and a lower portion inclined at an angle of between 30°–60° relative to the vertical, the improvement wherein the stabilizer plates are angularly offset against the direction of rotation of the rotor relative to a substantially radial position with respect to the rotor.

4,692,245

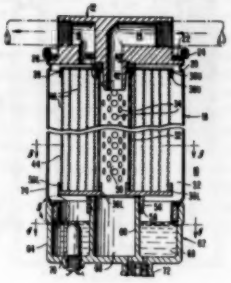
FILTER ASSEMBLY WITH HIGH PRESSURE CONNECTION TO COLLECTION BOWL

John F. Church, and Walter H. Stone, both of Modesto, Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 733,808, May 14, 1985. This application Oct. 7, 1985, Ser. No. 784,292

Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—232 **4 Claims**



1. An invention comprising a fuel filter unit including:

(a) a casing having a cylindrical peripheral wall and first and second fuel ports to define a fuel flow path through said filter unit;

(b) a first filter medium extending in a loop within said casing and separating a central fuel chamber from a peripheral fuel chamber, said peripheral fuel chamber disposed directly between said first filter medium and said casing, said first filter medium disposed intermediate said first and second fuel ports in said fuel flow path;

(c) a peripheral contaminant outlet operable to allow contaminants to directly exit from said peripheral fuel chamber by way of at least one contaminant channel;

(d) an end cap disposed below said first filter medium, said contaminant channel inwardly extending in said end cap; and

(e) an annular threaded portion distinct from said cylindrical peripheral wall and disposed in line below said end cap and at said cylindrical peripheral wall and operable to threadingly engage mating threads on a cylindrical peripheral wall of a collection bowl such that the engagement between said threaded portion and the mating threads separates said peripheral fuel chamber from ambient air,

said filter unit including a plurality of peripheral contaminant outlets allowing contaminants to directly exit from said peripheral fuel chamber by way of a corresponding plurality of contaminant channels extending inwardly in said end cap, said end cap including a plurality of downwardly projecting ribs, said contaminant channels extending between adjacent ones of said ribs,

said end cap including a lower annular first ridge, said ribs extending radially out from said first ridge to define a plurality of lower surface portions having peripheral edges and disposed between each pair of adjacent ribs, said ribs extending out beyond said lower surface portions to provide offset between said peripheral edges and an inner surface of said peripheral wall,

said annular threaded portion being distinct from said end cap and having said ribs at least partially resting thereon, all of said lower surface portions being co-planar and unbounded at their peripheral edges,

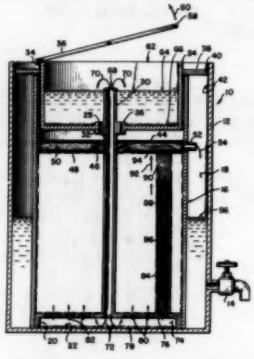
said end cap having a lower annular second ridge, concentric and within said first ridge, and an annular isolation seal disposed between said first and second ridges and operable to mate with a cylindrical interior wall of a collection bowl.

4,692,246

CARTRIDGE FILTER WITH PLURAL MEDIAS

Abraham E. Simon, 1122 Kenyon Ave., Plainfield, N.J. 07060

Filed Apr. 17, 1986, Ser. No. 853,053
Int. Cl.[4] B01D *27/02, 27/08*
U.S. Cl. 210—232 **6 Claims**



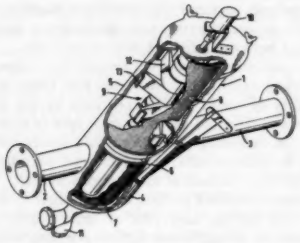
1. A fluid filter apparatus comprising a housing, a dish, a cartridge-like filter having a filter medium, means to removably secure said cartridge-like filter within a cavity formed by said housing, means to removably secure said dish to said cartridge-like filter, means to fluidly communicate the interior of said dish to the lowermost regions of said cartridge-like filter, means to fluidly communicate said lowermost regions of said cartridge-like filter to the interior of said cartridge-like filter, means to fluidly communicate the uppermost regions of said cartridge-like filter into the interior of said housing, an annular cartridge, said annular cartridge being disposed resting in the uppermost regions of said cartridge-like filter adjacent the uppermost filter medium thereof, said annular cartridge having one or more discharge ports, said discharge ports being engagable with openings in said outermost wall of said cartridge-like filter, and means to manually fluidly communicate into the interior of said housing.

4,692,247

FLUID FILTERING DEVICE

Itzhak Orlans, Hevel Korazim, Israel, assignor to Amiad Sinun Vehashkaya, M.P. Hevel Korazim, Israel

Filed Feb. 10, 1986, Ser. No. 828,557
Claims priority, application Israel, Mar. 7, 1985, 74527
Int. Cl.[4] B01D *25/02*
U.S. Cl. 210—314 **3 Claims**



1. A fluid filtering device comprising a housing with inlet and outlet ports through which fluid to be filtered flows into and out of the housing;

a tubular filter located in the housing with an inner side thereof in flow communication with the inlet port and an outer side thereof in flow communication with the outlet port so that all flow of said fluid through the housing passes through the filter; a tubular, contaminant discharge conduit centrally disposed in the filter and substantially coaxial therewith;

one or more transversely directed, tubular inlet limbs of said discharge conduit, each limb extending from the discharge conduit to a free mouthlike opening juxtaposed with respect to the inner side of the filter so as to provide a flowpath therefrom to the discharge conduit, each inlet limb terminating in a pair of flanges which extend outwardly with respect to the inlet limb mouthlike opening so as to present a flowing surface juxtaposed with respect to the inner filter surface;

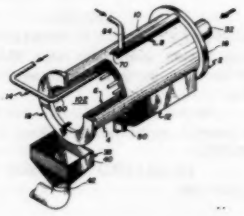
said tubular filter being formed of a plurality of stacked annular filter discs, each disc being of crenellated shape having outwardly directed bay portions alternating with inwardly directed projecting portions which have edges substantially located on a circular envelope substantially concentric with the disc, the stacked edges forming successive component cylindrical surfaces, the arrangement being such that rotational displacement of the discharge conduit together with at least one discharge limb results in the mouthlike opening of each discharge limb sweeping by a preselected section of the inner side of the tubular filter with the limb flanges bridging successive component cylindrical surfaces.

4,692,248

DRUM FILTER WITH RESIN BOUND PARTICULATE FILTER MEDIA

Forrest B. Stannard, Inverness, and Edward J. Highstreet, Crystal River, both of Fla., assignors to The Dehydro Corporation, Charlotte, N.C.

Filed Feb. 26, 1986, Ser. No. 833,000
Int. Cl.[4] B01D *33/02*
U.S. Cl. 210—403 **9 Claims**



1. A filter device designed to mitigate problems in the filtration of fluid suspensions that form flow resistant filter cake resistant to the flow of liquid and thereby rapidly reduce the rate of filtration, said device comprising in combination:

a cylindrical filter unit with means for rotation about an approximately horizontal axis, said unit having:

a tubular member with an inlet end and an outlet end, said member comprising:

an external porous wall formed of spirally wound wire with substantially uniform spacings between each revolution of said wire,

a plurality of spaced-apart bars or rods fixed normal to said spiralled wire on the inner surface thereof forming a multitude of cavities between said bars or rods above said wire, and

rigid filter media formed of particulate material bound in a resin matrix covering the inner surface of said wire and filling said cavities,

means to introduce influent to be filtered into said inlet end,

means to receive filtered solid material discharged from said outlet end,

first longitudinal means positioned atop said filter unit to

force pressurized gas through a cylindrical surface from the back side thereof, and

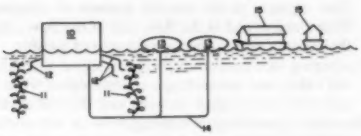
second longitudinal means beneath said filter unit to apply a vacuum to said filter unit to assist in removal of liquid from said influent by suction thereof through said rigid filter media.

4,692,249

FLOTATION PROCESS FOR SLUDGE RECOVERY AND ENERGY CONVERSION

Gerard Hammel, 440 Senator St., Brooklyn, N.Y. 11220

Filed Sep. 23, 1986, Ser. No. 910,477
Int. Cl.[4] C02F *11/04, 3/28*
U.S. Cl. 210—603 **3 Claims**



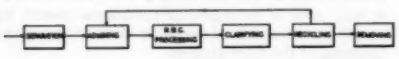
1. A process for offshore sewage treatment comprising:
(a) separating sewage into a watery effluent and a sludge;
(b) placing the sludge in flexible buoyant balloon storage tanks for anaerobic digestion;
(c) recovering and drying methane produced from the sludge during said digestion;
(d) transferring the sludge to drying barges;
(e) drying the sludge; and
(f) supplying the watery effluent to surrounding seaweed farms as a nutrient.

4,692,250

SIMULTANEOUS C AND N BIO-OXIDATION WITH MULTI-STAGE RBC RECYCLING

Gary E. Miller, P.O. Box 2838, West Lafayette, Ind. 47906

Filed Mar. 17, 1987, Ser. No. 27,011
Int. Cl.[4] C02F *3/08*
U.S. Cl. 210—619 **6 Claims**



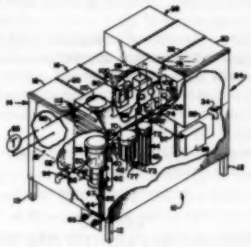
1. In an improved wastewater treatment process for a raw influent wastewater containing from about 50 to 500 milligrams per liter of suspended solids, more than about 100 milligrams per liter of materials measurable as soluble biological oxygen demand, and/or more than about 15 milligrams per liter of dissolved ammonia-nitrogen compounds, wherein simultaneously and continuously the following processing steps are occurring:
(A) particulates are separated from said raw influent wastewater to produce a starting clarified influent,
(B) such diluted influent is passed through successive stages of a multistage aerobic rotating biological contactor, said rotating biological contactor being characterized by having at least two stages and at least sufficient media surface area to reduce the soluble biological oxygen demand materials level and the amonia-nitrogen level to respective predetermined extents based upon assumed average clarified influent throughput rate, thereby to produce a biologically treated effluent,
(C) said biologically treated effluent is clarified to produce a treated clarified effluent, and
(D) said treated clarified effluent is removed as treated wastewater the rate of removal thereof being approximately equal to the rate at which said clarified influent is charged to said rotating biological contactor, said process further including the improvement which comprises the steps of:
(a) recycling a portion of said treated clarified effluent to said starting influent,
(b) admixing said recycled effluent with said starting influent at a rate sufficient to produce a composite diluted influent containing not more than an averagge of about 30 milligrams per liter of suspended solids, not more than an average of about 30 milligrams per liter of dissolved organic compounds producing biological oxygen demand, and not more than an average of about 5 milligrams per liter of dissolved ammonia-nitrogen compounds, and
(c) passing said composite diluted influent through said rotating biological contactor at a rate such that the hydraulic loading with respect to said rotating biological contactor ranges from about 5 to 30 gallons of said diluted influent per square foot of total media surface area per 24 hour day, said media surface area being such that, at said hydraulic loading, the respective amounts of said dissolved soluble biological oxygen demand organic compounds and of said dissolved ammonia-nitrogen compounds are each at least about 10 weight percent less than in said diluted influent before said passing.

4,692,251

SOLVENT CLEANSING APPARATUS

Wallace L. Hilgren, 7204 Fleetwood Dr., Minnesota, Minn. 55435

Filed Jul. 7, 1986, Ser. No. 882,540
Int. Cl.[4] B01C *13/00*
U.S. Cl. 210—651 **8 Claims**



8. A method for cleansing an aliphatic hydrocarbon solvent of the type having flash point temperatures in a range of about 100° F. to about 200° F. wherein said solvent is contaminated by a uniformly dispersed oil based contaminant, said method comprising:
prefiltering said contaminated solvent in a particulate filter selected to filter from said solvent contaminants sized greater than a predetermined minimum size;
filtering at least a portion of said oil based contaminant from said solvent subsequent to said prefiltering with said filtering performed in membrane filtration means having a semi-permeable membrane with a concentrate portion disposed on one side of said membrane and a permeate portion disposed on an opposite side of said membrane;
recycling a concentrate solvent from said concentrate portion and admixing said concentrate with contaminated solvent to form a mixture thereof and prefiltering and filtering said mixture of said concentrate solvent and said contaminated solvent;
passing solvent from said permeate portion to an outlet;
monitoring a temperature of solvent within said apparatus;
cooling said solvent until said temperature approximates a predetermined desired operating temperature;
discontinuing said filtering and prefiltering if a monitored temperature exceeds a predetermined safety temperature;
monitoring a pressure of said solvent; and

discontinuing said filtering and prefiltering if a monitored pressure exceeds a predetermined maximum.

4,692,252

METHOD OF REMOVING SCALE FROM WET OXIDATION TREATMENT APPARATUS

Mark T. Atwood, Arvada; Frank Carlson, Broomfield, and Hermann Peterscheck, Longmont, all of Colo., assignors to VerTech Treatment Systems, Inc., Denver, Colo.

Filed Mar. 24, 1986, Ser. No. 843,461
Int. Cl.[4] C02F *1/74*
U.S. Cl. 210—761 **23 Claims**

1. A method of removing inorganic and organic scales from surfaces of a vertical tube reaction apparatus having a plurality of concentric tubes extending vertically downward into the earth to a depth exceeding 3,000 feet in which a waste stream enters the apparatus in an influent flow and exits the apparatus in an effluent flow, said waste stream undergoes a chemical reaction as it is subjected to pressures and temperatures which increase with the depth of the fluid waste stream in the tubes and which also results in scale build-up comprising substances having retrograde solubility on the surface of the tubes as a function of the increase in temperature and pressure of the waste stream in the influent flow and effluent flow, said method comprising the steps of:

(a) interrupting the influent flow of the waste stream into the vertical tube reaction apparatus;

(b) circulating a quantity of an aqueous base solution through the vertical tube reaction apparatus to form a column of said aqueous base solution which exerts a selected fluid pressure and which contacts said scale with said aqueous base solution under the pressure of said column to convert a layer of scale into an acid soluble layer;

(c) circulating a quantity of an aqueous acid solution through the vertical tube reaction apparatus to form a column of said aqueous acid solution which exerts a selected fluid pressure and which contacts said scale with said aqueous solution under the pressure of said column to dissolve the acid soluble layer; and

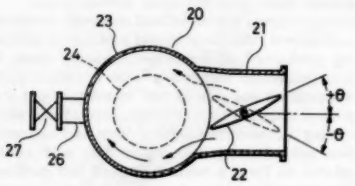
(d) resuming the influent flow of the waste stream into the vertical tube reaction apparatus.

4,692,253

METHOD AND APPARATUS FOR REMOVING EXTRANEOUS MATTERS

Katsumoto Otake, Hitachi; Masahiko Miyai, Mito; Yasuteru Mukai, and Isamu Okouchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,223
Claims priority, application Japan, Aug. 1, 1983, 58-139449
Int. Cl.[4] B10D *23/24*
U.S. Cl. 210—791 **5 Claims**



1. A method of removing extraneous matters from cooling water, comprising the steps of:

introducing cooling water into a casing;

passing said cooling water at a flow rate within an operating range of flow rates through a filter element disposed in said casing, and filter separating extraneous matters contained in said cooling water therefrom, so that at least some of the separated extraneous matter deposit on the upstream side of said filter element to increase the clogging of the filter element;

delivering said cooling water passing through said filter element from said casing;

detecting the pressure difference between the portions upstream and downstream of said filter element, and generating a pressure difference signal during said step of passing;

detecting the flow rate of said cooling water, and generating a flow rate signal during said step of passing;

providing characteristic pressure differences versus flow rates for a specific percent of filter clogging over the operating range of flow rates;

setting a threshold value of pressure difference in accordance with the provided characteristic pressure difference between the portions upstream and downstream of said filter element at the specific percent of clogging of said filter element and at the flow rate of the flow rate signal of the cooling water, during said step of passing;

comparing said pressure difference signal with said threshold value, and generating a control signal when said pressure difference signal exceeds said threshold value;

thereafter generating a turning flow of the cooling water around said filter element in response to said control signal when the pressure difference between the portions upstream and downstream of said filter element exceeds said threshold value so that the turning flow is sufficient for scraping off said extraneous matters deposited to said filter element therefrom; and

discharging said extraneous matters thus scraped off from said casing together with a part of said cooling water in response to said control signal.

4. An apparatus for removing extraneous matters from cooling water, comprising:

a casing;

an inlet pipe for introducing cooling water containing extraneous matters, disposed in said casing;

an outlet pipe for delivering said cooling water, disposed in said casing;

a filter element means for separating said extraneous matters from said cooling water, disposed in said casing;

means for passing said cooling water at a flow rate within an operating range of flow rates through the filter element disposed in said casing, and for filter separating extraneous matters contained in said cooling water therefrom, so that at least some of the separated extraneous matters deposit on the upstream side of said filter element to increase the clogging of the filter element;

a butterfly valve for deflecting said cooling water containing said extraneous matters, disposed in said inlet pipe to produce a turning flow around said filter element;

an extraneous matter discharge port for discharging said extraneous matters, disposed in said casing;

a blow-down valve for discharging said extraneous matters outside the system, connected to said discharge port;

a butterfly valve actuator for operating said butterfly valve, disposed in said casing;

a blow-down valve actuator for operating said blow-down valve, disposed in said casing;

means for detecting the pressure difference between the portions upstream and downstream of said filter element, and generating a pressure difference signal;

means for detecting the flow rate of said cooling water, and generating a flow rate signal;

means for providing characteristic pressure differences versus flow rates for a specific percent of filter clogging over the operating range of flow rates;

a setter means for setting a threshold value of pressure difference in accordance with the provided characteristic pressure difference between the portions upstream and downstream of said filter element at the specific percent of clogging of said filter element and at the flow rate of the flow rate signal of the cooling water;

a comparator means for comparing said pressure difference

signal with said threshold value, and generating signals for both of said butterfly valve actuator and said blowdown valve actuator when said pressure difference signal exceeds said threshold value;

means for operating said butterfly valve actuator for thereafter generating a turning flow of the cooling water around said filter element in response to said control signal when the pressure difference between the portions upstream and downstream of said filter element exceeds said threshold value so that the turning flow is sufficient for scraping off said extraneous matter deposited to said filter element therefrom; and

means for operating said blow down valve actuator for discharging said extraneous matters thus scraped off from said casing together with a part of said cooling water in response to said control signal.

4,692,254

FRACTURING OF SUBTERRANEAN FORMATIONS

Clare H. Kucera, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Division of Ser. No. 683,974, Oct. 20, 1984, which is a continuation of Ser. No. 316,186, Oct. 29, 1981, abandoned. This application Mar. 13, 1986, Ser. No. 839,837

Int. Cl.[4] C09K *3/00*; E21B *43/16, 43/26*

U.S. Cl. 252—8.551 **15 Claims**

1. A product useful as a crosslinker for aqueous polysaccharide solution produced by reacting by contacting (a) a zirconium alkoxide corresponding to the formula $Zr(OR)_4$ wherein each R independently is an alkyl group of from 1 to about 4 carbon atoms or an inertly-substituted such alkyl group, with (b) an alkanolamine corresponding to the formula $R'-N-CH_2-CH(OH)-R'')_2$, wherein the ratio of a:b is from about 1:2 to about 1:3,

(i) R' is hydrogen or—CH_2—CH(OH)—R", and

(ii) R" is hydrogen, methyl or ethyl; said process being conducted in a liquid reaction medium under substantially anhydrous conditions.

4,692,255

LUBRICATING GREASE COMPOSITION, ITS PRODUCTION AND USE

Norbert Matzat, and Hans Schreiber, both of Munich, Fed. Rep. of Germany, assignors to Optimol-Oelwerke GmbH, Munich, Fed. Rep. of Germany

PCT No. PCT/DE84/00028, § 371 Date Oct. 1, 1984, § 102(e) Date Oct. 1, 1984, PCT Pub. No. WO84/03100, PCT Pub. Date Aug. 16, 1984

Continuation of Ser. No. 668,723, Oct. 1, 1984, abandoned. This PCT application Feb. 1, 1984, Ser. No. 893,534

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303442

Int. Cl.[4] C10M *105/56*

U.S. Cl. 252—51.5 A **15 Claims**

1. In a lubricating grease composition of the type wherein mineral or synthetic oil is thickened to the properties of a lubricating grease with a polyurea compound as thickening agent, the improvement wherein, said polyurea compound comprises the reaction product of an isocyanate with at least 3 isocyanate groups in the molecule with a long-chained straight-chained or branched aliphatic monoamine.

4,692,256

MOLYBDENUM-CONTAINING LUBRICANT COMPOSITION

Masashi Umemura; Masanori Konishi; Aritoshi Fukushima; Junichi Hisano, and Toshiaki Okamoto, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Jun. 6, 1986, Ser. No. 871,647

Claims priority, application Japan, Jun. 12, 1985, 60-127309; Jun. 12, 1985, 60-127310

Int. Cl.[4] C10M *137/10*

U.S. Cl. 252—32.7 E **11 Claims**

1. A lubricant composition comprising a blend of a sulfur-containing compound and an oil-soluble molybdenum compound wherein the ratio of sulfur atoms to molybdenum atoms is higher than 0.5, said oil-soluble molybdenum compound having been obtained by reacting (1) at least one hexavalent molybdenum compound selected from the group consisting of molybdenum trioxide, molybdic acid and alkali salts of molybdic acid, with (2) a secondary amino compound having the formula

$$R_2-NH$$
$$|$$
$$R_3$$

wherein R_2 and R_3, which are the same or different, are hydrocarbon groups having 1 to 30 carbon atoms.

4,692,257

BORATED HYDROXY-CONTAINING COMPOSITIONS AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 753,098, Jul. 9, 1985, abandoned, which is a continuation of Ser. No. 304,482, Sep. 22, 1981, abandoned. This application May 12, 1986, Ser. No. 862,155

Int. Cl.[4] C10M *139/00*

U.S. Cl. 252—49.6 **8 Claims**

1. A lubricant composition comprising a major amount of lubricant selected from the group consisting of mineral lubricating oil, a synthetic lubricating oil, mixtures thereof or greases from any of these, and a friction-reducing amount of a borated 1,2-hydrocarbyl vicinal diol containing from 10 to 30 carbon atoms.

4,692,258

TETRAHYDROQUINOLINES AS ANTIOXIDANTS FOR LUBRICANTS

Michael Rasberger, Riehen; Paul Dubs, Basel, and Samuel Evans, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 742,245, Jun. 7, 1985, abandoned, which is a continuation of Ser. No. 623,630, Jun. 25, 1984, abandoned, which is a continuation of Ser. No. 557,558, Dec. 2, 1983, abandoned, which is a continuation of Ser. No. 403,696, Jul. 30, 1982, abandoned. This application Dec. 18, 1985, Ser. No. 810,543

Claims priority, application Switzerland, Aug. 10, 1981, 5130/81

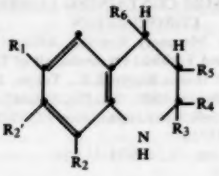
Int. Cl.[4] C10M *105/56*

U.S. Cl. 252—50 **10 Claims**

1. A lubricant composition, having excellent lubricating properties, which comprises

(a) a mineral oil, a synthetic oil, a hydraulic fluid or a lubricating grease, and

(b) 0.05 to 5% by weight, based on component (a), of a compound of formula I



wherein

R_1 and R_2 independently of one another are each hydrogen, C_1–C_{18}-alkyl or benzyl,

R'_2 is hydrogen or C_1–C_{12}-alkyl, or together with R_2 it forms a butadienediyl group,

R_3 and R_4 independently of one another are each C_1–C_{18}-alkyl, phenyl or benzyl, or R_3 and R_4 together with the carbon atom to which they are bound form a C_5–C_{12}-spiro-cycloalkyl ring,

R_5 is hydrogen or C_1–C_{18}-alkyl, and

R_6 is C_1–C_{18}-alkyl, or R_5 and R_6 together with the two carbon atoms to which they are bound are a C_5–C_{12} cycloaliphatic group.

4,692,259

WATER-ACTIVATED, EXOTHERMIC CHEMICAL DEICING FORMULATIONS

Ronald J. Roman, Renton, Wash., assignor to L-Bar Products Incorporated, Ravensdale, Wash.

Filed Aug. 29, 1986, Ser. No. 901,916

Int. Cl.[4] C09K *5/00, 3/18*

U.S. Cl. 252—70 **22 Claims**

1. A method for melting snow or ice on surfaces, comprising:

applying to the surface an effective amount of a chemical formulation comprising magnesium metal, magnesium oxide, and at least one chloride salt.

4,692,260

DISHWASHING COMPOSITIONS COMPRISING AN ENZYME AND A C_8–C_{10} ALKANOL WITH 0–2 MOLES OF PROPYLENE OXIDE

Eric Sung, Monheim; Peter Jeschke, Neuss; Klaus Schumann, Erkrath, and Theodor Altenschoepfer, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,039

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428834

Int. Cl.[4] C11D *3/075, 3/20, 3/386*

U.S. Cl. 252—99 **19 Claims**

1. A composition of matter comprising from about 0.1 to 5 parts by weight of at least one hydrolase enzyme and from about 0.1 to 10 parts by weight of an alkanol selected from the group consisting of a C_8–C_{10} primary, straight-chain or branched chain alkanol and a C_8–C_{10} primary, straight-chain or branched chain alkanol propoxylated with from 1 to 2 moles of propylene oxide per mole of alkanol, said composition being useful as a cleaning booster to dishwashing compositions and being present therein in an amount effective to improve the removal of a food substance from a food containing substrate at washing temperatures of about 40° C., the balance of said composition comprising polymeric alkali metal phosphate and/or phosphate substitutes, alkali metal silicates, and alkali metal carbonates.

4,692,261

SKIN BLEACHING DETERGENT BAR

Vito G. Filomeno, Mount Arlington, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 20, 1985, Ser. No. 811,602

Int. Cl.[4] C11D *1/12, 3/20;* **A61K** *7/135*

U.S. Cl. 252—105 **14 Claims**

1. A detergent bar composition having a pH of about 4 to about 7 comprising a compressed mixture of:

(a) an anionic detergent selected from the group consisting of sodium cocoyl isethionate, sodium methyl cocyl taurate and mixtures thereof;

(b) hydroquinone in amounts to effect depigmentation;

(c) tertiary butyl hydroquinone in amounts to maintain the stability of said hydroquinone against oxidation;

(d) a buffer which maintains the pH of said composition at about 4 to about 7;

(e) a paraffin, wax, starch, or dextrin constituent, or mixtures thereof; and

(f) water.

2. The composition of claim 1 which further comprises an additional stabilizer, in amounts to maintain the stability of said hydroquinone against oxidation, selected from the group consisting of sodium sulfite, sodium bisulfite, alpha tocopherol and mixtures thereof.

4,692,262

SKIN CLEANSER CAPABLE OF SOFTENING AND REMOVING SMEGMA

Robert L. Brown, 3917 Evergreen, Irving, Tex. 75061, and Elizabeth C. Stewart, No. 6 Pinecreek La., Houston, Tex. 77055

Filed Sep. 18, 1986, Ser. No. 908,697

Int. Cl.[4] C11D *3/48*

U.S. Cl. 252—106 **4 Claims**

1. A skin cleanser capable of softening and removing smegma and microbiological organisms which may be associated therewith from the human skin which comprises a mixture containing:

from a trace to 0.2% by weight, based on the total weight of said composition, as an active material of cetylpyridinium chloride,

from a ttace to not more than 20 ppm chlorine dioxide,

from a trace to 2% by weight, based on the total weight of said composition as an active material, of polyoxyethylene (20) sorbitan monostearate; and

from a trace to not more than 2% sodium lauryl sulfate.

4,692,263

STRIPPING PASTE FOR REMOVING LACQUER AND PAINT COATINGS

Werner Eberhardt, Leichlingen, and Rudolf Ziegler, Kuerten, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,987

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534278

Int. Cl.[4] C11D *7/50*

U.S. Cl. 252—122 **20 Claims**

1. A stripping paste for removing lacquer and paint coatings, said stripping paste being based on substantially involatile, low-toxicity solvents and thickeners based on fatty acid salts, and comprising:

(a) from about 94 to about 66% by weight of a diethylene glycol monoalkyl ether corresponding to the general formula

$$R—O—CH_2CH_2—O—CH_2CH_2—OH$$

wherein R is an ethyl or propyl group;

(b) from about 1 to about 4% by weight of the sodium salt of a C_{14}–C_{18} fatty acid; and

(c) from about 5 to about 30% by weight of water, all weights being based on the weight of said stripping paste.

4,692,264

STABLE, PUMPABLE AQUEOUS ZEOLITE SUSPENSIONS

Robert Gresser, Lyon, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Aug. 12, 1985, Ser. No. 764,644
Claims priority, application France, Aug. 10, 1984, 84 12649
Int. Cl.[4] C11D *3/12*
U.S. Cl. 252—140 18 Claims

1. A composition of matter which comprises a stable, pumpable aqueous suspension of a zeolite having a pH ranging from about 10 to about 11.5, said zeolite suspension comprising stabilizing material in an amount effective to prevent sedimentation upon storage, said stabilizing material consisting essentially of alkaline earth metal cations wherein said alkaline earth metal cations alone are suitable for the stabilization of the zeolite suspension.

4,692,265

DRYING COMPOSITION AND METHOD

Stephen R. Burghardi, Minnetonka, Minn., assignor to Domain, Inc., New Richmond, Wis.

Filed Jun. 22, 1984, Ser. No. 623,336
Int. Cl.[4] C09K *3/00*; F26B *3/00*; A23K *3/02*
U.S. Cl. 252—194 7 Claims

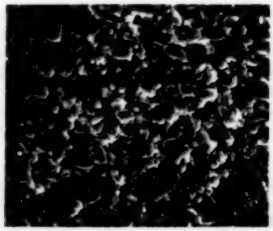
1. A drying composition for plants comprising an aqueous, sprayable solution essentially free of water-insoluble ingredients and consisting essentially of sodium sesquicarbonate in an amount not less than about 20% by weight, potassium carbonate in an amount not less than about 5% by weight and sodium carbonate in an amount not less than about 20% by weight, all based upon the total dry carbonate weight.

4,692,266

SOLID SCINTILLATOR COUNTING COMPOSITIONS

Lorenzo F. Costa; David C. Harrington, and Raymond S. Miller, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,232
Int. Cl.[4] C09K *11/06*
U.S. Cl. 252—301.17 12 Claims



1. A dry particulate scintillator counting composition for the detection of radiative substances in a liquid, comprising a mixture of fluor particles and a binder bonding said particles into a coherent structure, the weight amount of said fluor being sufficiently greater than the weight amount of said binder as to render said structure sufficiently porous between the disposed particles of fluor to provide transport of a saturating amount of liquid throughout at least 50% of the volume of the composition.

4,692,267

USE OF POLYMERS OF ALKYLVINYL ETHERS TO PREVENT OR ELIMINATE FOAM ON AQUEOUS MEDIA

Jürgen Fock, Düsseldorf; Eberhard Esselborn; Hans-Ferdi Fink, both of Essen, and Wernfried Heilen, Rheinberg, all of Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Nov. 13, 1985, Ser. No. 797,637
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442727
Int. Cl.[4] C09K *3/00*; B01D *19/04*
U.S. Cl. 252—321 22 Claims

1. In a method for preventing or eliminating foam in aqueous media wherein a foam preventing or eliminating effective amount of defoaming agent is added to the aqueous media, the improvement which comprises said defoaming agent comprising one or more polymers of alkylvinyl ethers having alkyl radicals containing from 1 to 18 carbon atoms and a weight average molecular weight ,eovs/M/ „ of from 400 to 10,000.

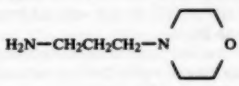
4,692,268

METHOD FOR CONTROLLING VISCOSITY OF ORGANIC LIQUIDS AND COMPOSITIONS

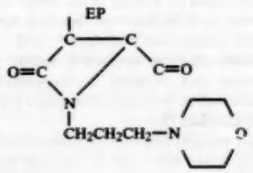
Robert D. Lundberg, Bridgewater; Robert R. Phillips, Spring Lake Heights; L. Sherwood Minckler, Watchung, and David Y. Chung, Edison, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 30, 1985, Ser. No. 814,403
Int. Cl.[4] C10M *149/00*, *155/00*
U.S. Cl. 252—33.4 12 Claims

1. A hydrocarbon solution containing a polymer complex, said complex being present at a level of 0.05 to 20 weight percent of said solution, said polymer complex being a complex of: a metal sulfonated ethylene propylene terpolymer having a sulfonate content of 4 to 100 milliequivalents per 100 grams and a metal cation selected from the group consisting of zinc and transition elements, and an ethylene propylene copolymer or terpolymer having pendant basic amine groups, said pendant basic groups ranging from about 4 meg. to about 100 meg. wherein the ratio of the polymer containing the metal cation to the polymer containing basic amine groups being about 10 to about 0.1, wherein said ethylene propylene copolymers are grafted with maleic anhydride and subsequently reacted with N-aminopropyl morpholine on



thereby forming



4,692,269

GAS-RELEASING COMPOSITION FOR TAILORING GAS EVOLUTION OF SYSTEM

Chester J. Kmiec, Amherst, and Michael F. Novits, Buffalo, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 780,124, Sep. 25, 1985. This application May 13, 1986, Ser. No. 862,846

Int. Cl.[4] C08V *9/10;* C06D *5/00*

U.S. Cl. 252—350 6 Claims

1. A gas-generating composition consisting essentially of a t-alkylhydrazinium salt and/or carbonylhydrazine and at least one compound selected from free radical forming sources; metal oxides selected from ZnO, PbO, Pb_3O_4 or MgO; and sulfur or sulfur donor compounds wherein when sulfur and/or a sulfur donor compound is used, the composition will also contain one or more members selected from sulfur accelerators, metal oxides, and amino-alcohols.

4,692,270

SURFACE ACTIVE AGENT

Atsushi Sato, Tokyo; Yoshikazu Murai, Yokohama; Tatsuo Yamaguchi, Hino; Kanji Mochizuki, and Kunio Sugisawa, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

PCT No. PCT/JP85/00059, § 371 Date Sep. 23, 1985, § 102(e) Date Sep. 23, 1985, PCT Pub. No. WO85/03647, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 14, 1985, Ser. No. 783,225

Claims priority, application Japan, Feb. 14, 1984, 59-24513

Int. Cl.[4] B01F *17/02, 17/12;* C07C *139/06*

U.S. Cl. 252—353 7 Claims

1. A water soluble surface active agent obtained by sulfonating a reaction product boiling higher than hydrocarbons contained in a mixture and not lower than 260° C., under sulfonating conditions, followed by neutralization, which reaction product is obtained by treating said mixture in liquid phase in the presence of an acid catalyst at a reaction temperature of 0° to 330° C. to alkylate aromatics with aliphatic olefins followed by distillation, said mixture consisting of:

(A) 20–95 weight percent of a thermal-cracked oil distillate obtained from a delayed coking process for coking a petrolic heavy residual oil at a temperature not lower than 400° C. and not exceeding 700° C., said distillate containing aliphatic olefins; and, either

(B) 80–5 weight percent of one or more members boiling in the range of 150° to 250° C. and selected from the following (a) through (c):

(a) a thermal-cracked by-product oil distillate obtained by thermal cracking of a petrolic light oil at a temperature of 750° to 850° C. followed by treatment for reducing the content of unsaturated compounds;

(b) an reformate distillate obtained by catalytic reforming of a petrolic light oil boiling in the range of 50° to 250° C., followed by treatment for reducing the content of unsaturated compounds if necessary; and

(c) an aromatic distillate consisting mainly of aromatic hydrocarbons and obtained by separation from said thermal-cracked by-product oil distillate (a) and/or said reformate distillate (b); or

(C) 80–5 weight percent of aromatic hydrocarbons having a boiling range lower than 150° C. and not having an aliphatic double bond.

4,692,271

CONCENTRATED AQUEOUS SURFACTANT COMPOSITIONS

Edward T. Messenger, Workington; Douglas E. Mather, and Brinley M. Phillips, both of Whitehaven, all of United Kingdom, assignors to Albright & Wilson Ltd., Oldbury, Warley, England

Continuation of Ser. No. 967,576, Dec. 8, 1978, abandoned. This application Jul. 24, 1980, Ser. No. 171,998

Claims priority, application United Kingdom, Dec. 9, 1977, 51293/77

Int. Cl.[4] B01F *17/02, 17/10, 17/12*

U.S. Cl. 252—354 30 Claims

1. A pumpable aqueous surfactant composition consisting essentially of water, and an active surfactant mixture in an amount between above 45% and below 80% by weight and sufficient to form the "G" phase with said water, said active mixture consisting of at least 5% each by weight of the composition, of different surfactant products selected respectively from at least 2 of the classes consisting of: alkyl sulphates; alkyl ether sulphates; olefin sulphonates; alkyl benzene sulphonates; alkyl sulphosuccinates; alkanolamide sulphosuccinates; paraffin sulphonates; fatty carboxylates; alkyl ether carboxylates; alkyl phosphates; alkyl ether phosphates; alkyl phenol sulphates; alkyl phenol ether sulphates; alkyl phenol ether sulphonates; fatty ester sulphonates; fatty acid sulphonates; acyl sarcosinates; and acyl taurides; wherein, in each case, there are alkyl, alkenyl or acyl groups which have an average total of from 8 to 22 carbon atoms and any ether groups comprise glyceryl groups and/or polyoxyalkylene groups, which polyoxyalkylene groups comprise from 1 to 20 ethylene oxide and/or propylene oxide units, said aqueous surfactant composition being in the "G" phase at a temperature below 23° C.

27. A composition according to any one of claims 1, 4, 5, 6, 7 or 2 wherein the active mixture comprises at least 10% by weight of an alkyl sulphosuccinate and at least 10% by weight of an alkyl sulphate.

4,692,272

THERMALLY STABLE ADHESIVE COMPRISING SOLUBLE POLYIMIDE RESIN AND EPOXY RESIN

Jagadish C. Goswami, New City, N.Y., and Joseph A. Aurichio, Anderson, S.C., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 660,593, Oct. 15, 1984, Pat. No. 4,604,230. This application Sep. 12, 1985, Ser. No. 774,431

Int. Cl.[4] H01B *1/021*

U.S. Cl. 252—514 53 Claims

1. An adhesive composition comprising: (a) a soluble polyimide resin; (b) a solvent for said polyimide resin; (c) an epoxy resin; (d) a cross-linking agent reactive with the polyimide solvent of (b); and (e) a catalyst which catalyzes the cross-linking reaction of (b) and (d).

4,692,273

NOVEL GEL COMPOSITIONS, PROCESSES FOR MAKING SAME AND USES IN TRANSMITTING AND MEASURING ELECTRICAL IMPULSES

Katherine Lawrence, Trabuico Canyon, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 15, 1985, Ser. No. 723,391

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—518 11 Claims

1. An aqueous gel specially adapted for transmitting electrical impulses in connection with mammalian skin which comprises about 0.1% by weight of an organic titanate, about 1.5% up to about 10% by weight of at least one galactomannan gum, and a small but effective amount of from about 1% up to about 25% by weight of a conductive salt.

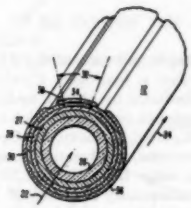
4,692,274
PROTECTIVE INTERLAYER FOR HIGH TEMPERATURE SOLID ELECTROLYTE ELECTROCHEMICAL CELLS

Arnold O. Isenberg, Forest Hills Boro, and Roswell J. Ruka, Churchill Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 749,365, Jun. 27, 1985, Pat. No. 4,598,467, which is a division of Ser. No. 657,923, Oct. 5, 1984, Pat. No. 4,547,437. This application Jun. 6, 1986, Ser. No. 871,233

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—521 **2 Claims**



1. A doped yttrium chromite composition selected from the group consisting of:

(a) a chromite having the chemical formula $Y_{1-x}Ca_xCr_{1-y}Co_yO_3$, where $x=0.005$ to about 0.5 and $y=0.005$ to about 0.5, and

(b) a chromite having the chemical formula $YCR_{1-y}Co_yO_3$, where $x=0.005$ to about 0.5 and $y=0.005$ to about 0.5.

4,692,275
DETERGENT COMPOSITIONS CONTAINING AN ALKYLBENZENE SULFONATE AND ALCOHOL ETHOXYSULFATE SURFACTANT SYSTEM

Isaac I. Secemski, Flushing, N.Y., and Jesse L. Lynn, Jr., Englewood, N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 23, 1986, Ser. No. 856,069

Int. Cl.[4] C11D *1/37, 3/075*

U.S. Cl. 252—534 **12 Claims**

1. A detergent composition consisting essentially of:

(i) a C_8–C_{18} alkylbenzene sulfonate;

(ii) a C_{12}–C_{15} alcohol ethoxysulfate formed with from 6 to 30 units ethylene oxide, and where the average weight of ethylene oxide is from 60 to 80% by weight based on non-sulfated ethoxylated alcohol; and

(iii) from 20 to 50% by weight of a builder

wherein the amount of (i) to (ii) ranges from 10 to 20% and the ratio of said sulfonate to said sulfate is from 3.5:1 to 1.5:1.

6. A detergent composition according to claim **1** wherein the builder salt is sodium tripolyphosphate present in an amount from about 20% to about 40%.

4,692,276
NON-ALKALINE, FOAMABLE BATHROOM CLEANER

Charles H. Schramm, 53 Black Mount Ct., Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 623,494, Jun. 22, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,688

Int. Cl.[4] C11D *1/29, 3/32*

U.S. Cl. 252—545 **11 Claims**

1. An aqueous, non-alkaline, spray foamable bathroom cleaning composition that is particularly effective in removing lime soap residues and hard water salt deposits from sinks, toilet bowls, bathtubs, shower enclosures and metal surfaces, said cleaning composition consisting essentially of:

a. 1 to 30% by weight of a substance selected from the group consisting of alcohol sulfates of the formula

$$RO(CH_2CH_2O)_nSO_3X$$

where R is a straight chain hydrocarbon radical having from about 10 to 18 carbon atoms, n is a number from 0 to 6 and X is sodium, potassium, hydrogen, ammonium, mono-, di-, and tri-lower alkylammonium, and alkanolammonium in which lower alkyl and alkanol embrace methyl, ethyl and propyl;

b. 1 to 15% by weight of a substance selected from the group consisting of alkyl and alkanolamides of the structure

$$RCON(R')(R'')$$

where R is a straight chain hydrocarbon radical having from about 9 to 19 carbon atoms, R′ and R″ can be hydrogen, hydroxyethyl, hydroxypropyl, and alkyl, with the latter having from about 1 to 4 carbon atoms;

c. 1 to 40% by weight of a substance selected from the hydrotropes consisting of short chain alkylbenzene sulfonates of the formula

$$RSO_3X$$

where R is tolyl, xylyl and cumyl, X is sodium, potassium, hydrogen, ammonium, alkylammonium and alkanolammonium as described in (a) above;

d. 2 to 30% by weight of a nitrilotriacetate of the formula

$$N(CH_2COOX)_3$$

or, an amineacetate of the formulae

$$(XOOCCH_2)_2NCH_2CH_2N(CH_2COOX)_2,$$

and

where X is sodium, potassium, hydrogen, ammonium, alkanolammonium, alkylammonium, and alkylalkanolammonium, whee the alkyl and alkanol groups are as described in (a) above.

e. 0 to 12% by weight of a conventional nonionic or anionic sulfonate surfactant

f. 55 to 90% by weight water, and

g. an amount of mineral acid (sulfuric or hydrochloric acid) to provide a pH within the range of pH 3 to 7.

4,692,277
HIGHER MOLECULAR WEIGHT DIOLS FOR IMPROVED LIQUID CLEANERS

Michael P. Siklosi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1985, Ser. No. 811,268

Int. Cl.[4] C11D *1/22, 3/20*

U.S. Cl. 252—558 **12 Claims**

1. A hard surface liquid cleaner composition consisting essentially of:

(a) from about 0.1% to about 10% of a nonsoap surfactant selected from the group consisting of: anionic, cationic, nonionic, zwitterionic, amphoteric surfactants and mixtures thereof;

(b) from about 0.5% to about 25% of a diol selected from the group consisting of C_6–C_{12} diols and mixtures thereof; wherein at least one hydroxy group of said diol is a primary or secondary hydroxy group and wherein said diol has a maximum solubility of about 12 g/100 g of water at 20° C.;

(c) from about 1% to about 30% of a detergency builder salt; and

(d) at least about 60% water.

4,692,278

PROCESS FOR THE PREPARATION OF 1,4-DIAMINOANTHRAQUINONES

Rudolf Blattner, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

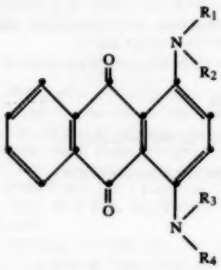
Filed Mar. 26, 1986, Ser. No. 844,410

Claims priority, application Switzerland, Apr. 1, 1985, 1399/85

Int. Cl.[4] **C07C** *97/24*

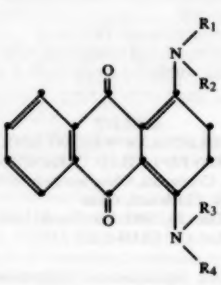
U.S. Cl. 260—367 **19 Claims**

1. In a process for the preparation of a 1,4-diaminoanthraquinone of formula (1)



(1)

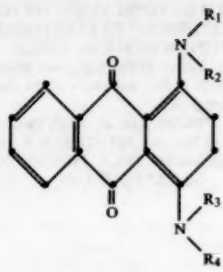
wherein each of R_1, R_2, R_3 and R_4 independently of one another is hydrogen, C_1–C_{12}-alkyl which is unsubstituted or substituted by phenyl, hydroxy, cyano, sulfo or dialkylamino, naphthyl, or phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, phenoxy, C_1–C_4-alkylcarbonyl or phenyl, by oxidation of a 2,3-dihydro-1,4-diaminoanthraquinone of formula (2)



(2)

wherein R_1, R_2, R_3 and R_4 are as defined above, with nitrobenzene, at elevated temperature, in the presence of an organic base and/or an inorganic base, wherein the improvement comprises carrying out the reaction at a temperature in the range from 100° to 200° C. at reduced pressure while simultaneously distilling off 3 to 20 moles of nitrobenzene per mole of compound of formula (2).

13. A process for the preparation of an anthraquinone imide, which process comprises oxidizing a 2,3-dihydro-1,4-diaminoanthraquinone of formula (2)



(2)

wherein R_1 is hydrogen and each of R_2, R_3 and R_4 independently of one another is hydrogen, C_1–C_{12}-alkyl which is unsubstituted or substituted by phenyl, hydroxy, cyano, sulfo or dialkylamino, naphthyl, or phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, phenoxy, C_1–C_4-alkylcarbonyl or phenyl, with nitrobenzene, said reaction being carried out at a temperature in the range from 100° to 200° C. at reduced pressure while simultaneously distilling off 3 to 20 moles of nitrobenzene per mole of compound of the formula (2), and subsequently condensing the resultant 1,4-diaminoanthraquinone, without isolating it, with an aromatic halogen compound in the presence of a base and a copper catalyst to give the anthrimide, the condensation being effected by heating the halogen compound and the resultant suspension of the 1,4-diaminoanthraquinone very rapidly to the reaction temperature.

4,692,279

PREPARATION OF ACYLOXY BENZENE SULFONATE

Marvin Nussbaum, Skokie, Ill., assignor to Stepan Company, Northfield, Ill.

Filed Apr. 15, 1985, Ser. No. 723,217

Int. Cl.[4] **C07C** *143/90, 69/00*

U.S. Cl. 260—402 **13 Claims**

1. A process for making an acyloxy benzene sulfonate salt of at least about 80 weight percent purity on a total composition dry weight basis from a corresponding acyloxy benzene comprising the steps of

(a) contacting substantially pure acyloxy benzene with SO_3 at a temperature ranging from about −20° to 50° C. to produce an intermediate reaction product which comprises about a 1:1 molar adduct of said SO_3 and said acyloxy benzene,

(b) maintaining said intermediate reaction product at an average temperature in the range from about 25° to 75° C. for a time inversely ranging from about 0.1 to 4 hours sufficient to produce a product composition containing at least about 80 weight percent of the corresponding acyloxy benzene sulfonic acid, and

(c) admixing the resulting said acyloxy benzene sulfonic acid with an aqueous solution of a base of a cation selected from the group consisting of alkali metal salts, alkaline earth metals, and ammonium to produce an aqueous solution containing the corresponding salt of said acyloxy benzene sulfonic acid.

4,692,280

PURIFICATION OF FISH OILS

John Spinelli; Virginia F. Stout, and William B. Nilsson, all of Seattle, Wash., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 1, 1986, Ser. No. 936,305

Int. Cl.[4] **C11B** *3/00*

U.S. Cl. 260—420 **4 Claims**

1. A process for the purification of fish oil which comprises extracting the fish oil with supercritical carbon dioxide at a

pressure of 1070 to 10,000 psi and at a temperature of 35° C. to 95° C. first to remove odoriferous and volatile impurities present in the fish oil and then with additional supercritical carbon dioxide to separate lightly colored fish oil from a more darkly colored residue.

4,692,281

CARBOXYTETRALINEPHOSPHONIC ACIDS AND PROCESS FOR MAKING THEM

Werner Pieper, Kerpen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

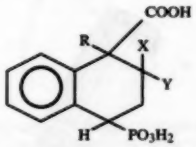
Filed May 2, 1986, Ser. No. 859,077

Claims priority, application Fed. Rep. of Germany, May 18, 1985, 3517970

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.4 R **3 Claims**

1. Mono- and dicarboxytetralinephosphonic acids of the general formula I



in which R stands for hydrogen or an alkyl group, X stands for hydrogen or a carboxylic group, and Y stands for hydrogen or an alkyl group.

4,692,282

PHENYLTETRALINE-DIPHOSPHONIC ACIDS AND PROCESS FOR MAKING THEM

Werner Pieper, Kerpen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

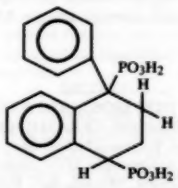
Filed May 2, 1986, Ser. No. 859,123

Claims priority, application Fed. Rep. of Germany, May 18, 1985, 3517969

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.4 P **5 Claims**

1. 1-phenyl-tetraline-1,4-diphosphonic acids of the formula



4,692,283

CENTRIFUGAL GAS-LIQUID CONTACT APPARATUS

James Wem, Marton, and Rowland J. P. Brierley, Yarm, both of England, assignors to Imperial Chemical Industries plc, London, England

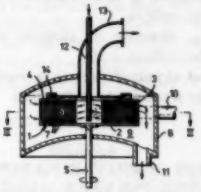
Continuation of Ser. No. 435,302, Oct. 19, 1982, abandoned. This application Sep. 29, 1986, Ser. No. 912,661

Claims priority, application United Kingdom, Oct. 26, 1981, 8132249

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—89 **1 Claim**

1. Gas-liquid contact apparatus comprising a rotor having a generally cylindrical outer wall parallel to the axis of rotation of said rotor, a permeable element mounted within the rotor for rotation therewith, means to supply liquid and gas to the rotor and means for conducting gas and liquid respectively from the rotor, said permeable element being a plurality of strips of permeable material selected from the group consisting of knitted fabrics, woven fabrics, non-woven fabrics and skeletal foams, superimposed progressively from the outer wall inwards towards said axis of rotation and together forming a plurality of discrete concentric layers in contact with each



other, the strips having a width substantially equal to the axial depth of the rotor and having a length less than the circumferential length of the outer wall of the rotor, the strips being in end-to-end abutment, and th abutments being staggered circumferentially in adjacent layers, said strips forming a permeable element which is stable in use.

4,692,284

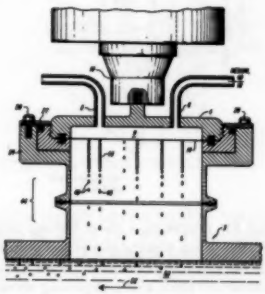
METHOD AND APPARATUS FOR FORMING DROPLETS AND MICROCAPSULES

William I. Braden, Norfolk, Mass., assignor to Damon Biotech, Inc., Needham Heights, Mass.

Filed Apr. 30, 1986, Ser. No. 857,854

Int. Cl.⁴ A61K *9/62*; B01J *13/02*; B28B *1/54*

U.S. Cl. 264—4.3 **16 Claims**



1. Apparatus for forming microcapsules of a desired size from a fluid medium containing living culture material by the atomization of the medium, such apparatus comprising:

a flow chamber for flowing the medium therethrough and including

(a) a flow cap, having an inlet port and

(b) a wall member having first and second opposing sides, said wall member being attached to the cap such that the cap and said first side define said chamber, said wall also having a plurality of orifices formed therethrough;

pressure means, for pressurizing the flow chamber to drive the medium through the orifices;

vibration means for vibrating the chamber to atomize the medium flowing through the orifices; and

means for coupling the apparatus to a collection vessel on the second side of the wall so as to deliver to the collection vessel said atomizing flow.

8. A method for forming microcapsules of a fluid medium containing living culture material by the atomization of the medium and the treatment of atomized droplets thereof with a treatment fluid, such method comprising the steps of:

flowing the medium through an inlet port into a flow chamber having a flow cap and a wall member having first and second opposing sides, said wall member being attached to the cap such that the cap and said first side define said chamber, said wall also having a plurality of orifices formed therethrough;

providing pressure in said chamber to drive the medium through the orifices,

vibrating the chamber to atomize the medium driven through the orifices, and

receiving said atomized flow in a vessel of the treatment fluid on the second side of the wall.

4,692,285

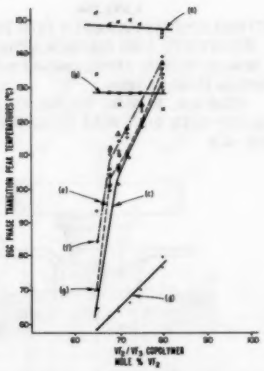
PROCESS OF PREPARING NONFIBROUS, PIEZOELECTRIC POLYMER SHEET OF IMPROVED ACTIVITY

Philip E. Bloomfield, Bala Cynwyd, and Seymour Preis, Allentown, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 1, 1985, Ser. No. 750,443

Int. Cl.[4] B29C *71/04*

U.S. Cl. 264—22 **6 Claims**



1. A process for preparing a sheet having improved piezoelectric properties when electrically poled comprising heating a nonfibrous, unoriented copolymer resin sheet of at least about 25 micrometers thick and comprising about 65 to 85 mol % of vinylidene fluoride and from 15 to about 35 mol % of at least one other copolymerizable, substituted, monolefinic monomer having from 2 to 4 carbon atoms in the olefinic chain to a temperature within a range of above the crystalline melting temperature (T_m) and below the dielectric strength degradation temperature (T_d) of said sheet for a time period of at least 20 minutes whereby said sheet has improved dielectric strength and, after poling, has a hydrostatic coefficient (g_h) of magnitude at least 0.100 V·m/N.

4,692,286

METHOD OF PRODUCING A CONTINUOUS LENGTH STRUCTURE

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 738,403, May 28, 1985, Pat. No. 4,598,755. This application Apr. 3, 1986, Ser. No. 847,702

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.[4] B22C *9/10*; B22D *11/00*; B29C *35/10, 41/24*

U.S. Cl. 264—29.1 **9 Claims**

1. A process for making a continuously-produced structure comprising the steps of:

continuously molding greensand to form a molded greensand core;

forming a mold pattern in said core;

pouring liquid material in the mold pattern formed in said greensand core;

solidifying said poured material; and

removing said greensand from said solidified material structure.

4,692,287

PROCESS FOR MAKING A MOLDED POROUS FLUOROPLASTIC RESIN MATERIAL

Robert D. Timmons, R.F.D. Meadowdale Rd., Prairie Du Sac, Wis. 53578

Filed Aug. 25, 1983, Ser. No. 526,387

Int. Cl.[4] C08J *9/24, 9/26*; C01N *1/14*; B21B *49/08*

U.S. Cl. 264—41 **6 Claims**

1. A process for making a shaped filter material comprising blending a fluoroplastic resin, said resin being a polymer including recurring fluoroplastic monomers each having the formula $(CF_2—CF_2)_n$ with powdered stearic acid as a sacrificial agent which will volatize at a temperature in the range of 350° F. to 450° F. to form a vaporous mixture which distributes itself in channels within said resin, molding the resulting blend to shape it into a desired form for use as a filter, applying pressure to the formed blend, removing the formed blend from the mold, heating the formed blend to a temperature in the range of 350°0 F. to 450° F. at which said sacrificial agent vaporizes and removes itself from said resin, heating said resin, free of said sacrificial agent, to a high temperature in the range of about 400° F. to 750° F. for a time sufficient to sinter the resin, wherein said blend contains about 5 to 99 percent of fluoroplastic resin and correspondingly 95 to 1 percent of stearic acid.

4,692,288

METHOD OF HOT ISOSTATIC PRESSING OF A POROUS SILICON CERAMIC COMPACT

Axel Rossmann, and Werner Huther, both of Karlsfeld, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 21, 1980, Ser. No. 199,152

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945513

Int. Cl.[4] C04B *35/62*

U.S. Cl. 264—56 **12 Claims**

1. A method of hot isostatic pressing of a porous silicon ceramic compact, comprising the steps of:

providing a fluid impermeable container and a powder,

placing the compact and the powder within the container so that the compact is completely embedded in the powder, the powder thereby separating the compact from the container, and

subjecting the container and its contents to heat and fluid pressure, the pressure being transmitted to the compact through the container and the powder, the heat and pressure being insufficient to sinter the powder and insufficient to cause the powder to chemically react with the compact.

4,692,289
METHOD OF MANUFACTURING VOLTAGE-DEPENDENT RESISTOR

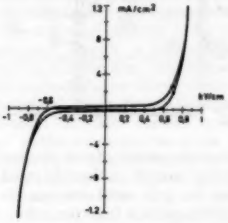
Detlev Hennings; Axel Schnell, and Herbert Schreinemacher, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 382,910, May 28, 1982, Pat. No. 4,581,159. This application Jul. 11, 1985, Ser. No. 753,757

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121289

Int. Cl.[4] C04B *33/34*

U.S. Cl. 264—61 **12 Claims**



1. A method of manufacturing a voltage-dependent resistor having a ceramic sintered body consisting of a polycrystalline alkaline earth metal titanate doped to N-type conductance with a metal oxide and which body is provided with electrodes on opposite located surfaces thereof, has a Perowskite structure, consists of a strontium titanate containing excess TiO_2 which titanate has a formula selected from the group consisting of $(Sr_{1-x}Ln_x)TiO_3.YTiO_2$ and $Sr(Ti_{1-x})Me_x)O_3.YTiO_2$ wherein Ln is a rare earth metal, Me is a metal having a valence of at least 5, $0.0005<x<$solubility limit of the Ln in the Perowskite crystal phase and Y equals 0.001 to 0.02 and is provided on its grain boundaries with insulating layers produced by diffusion into the surface layers of said grains by a metal oxide or a metal oxide compound, each of said metal oxide and said metal oxide compound having a melting point below that of said sintered body, characterized by the steps of forming a molded product of the starting substances of the composition of said body, sintering said molded product in a reducing atmosphere to form a sintered body, covering the surface of said thus sintered body with a suspension comprising at least a metal oxide or a metal oxide compound each having a melting-point below that of said sintered body and then heating said thus covered sintered body in an oxidizing atmosphere at a temperature which lies above the melting-point of the suspension component(s).

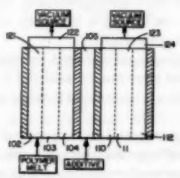
4,692,290
PROCESS FOR DEVOLATILIZING MOLTEN OXYMETHYLENE POLYMER

Douglas W. Steele, Bishop; George S. Nash, Kingsville; John W. Dorsey, Bishop; Ronald S. Christy, Kingsville, all of Tex., and Timothy L. Burns, Edgewood, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 12, 1985, Ser. No. 797,054

Int. Cl.[4] B29B *7/84*

U.S. Cl. 264—101 **11 Claims**



1. A process for removing volatile materials from a molten oxymethylene polymer, comprising passing the molten polymer through a rotating disk polymer processor having at least three stages, the three stages comprising in sequence a first devolatilization stage, a stabilization stage and a last devolatilization stage, the molten polymer in the first devolatilization stage being maintained at a temperature above its melting point in the temperature range of from about 160° C. to about 220° C. and at a vapor space pressure of from about 0.1 to about 300 Torr, the polymer in the stabilization stage being maintained in the molten state at a temperature of from 160° C. to about 220° C., the polymer in the last devolatilization stage being maintained in the molten state at a temperature of from about 160° C. to 190° C. and at a vapor space pressure of from about 0.1 to about 100 Torr.

4,692,291
MOLDING METHOD USING FAST CURING FIBER REINFORCED, LOW VISCOSITY THERMOSETTING RESIN

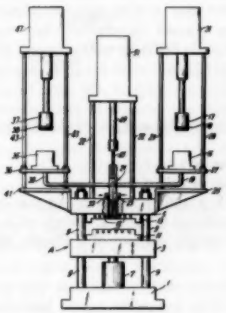
Richard G. Angell, Jr., Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 135,906, Apr. 14, 1980, which is a continuation-in-part of Ser. No. 35,011, May 1, 1979, abandoned. This application May 9, 1984, Ser. No. 607,733

Filed May 9, 1984, Ser. No. 607,733

Int. Cl.[4] B29C *43/20, 45/16*

U.S. Cl. 264—109 **29 Claims**



1. A process for rapidly fabricating fiber reinforced thermoset resin articles in which the fiber reinforcement comprises one or more fibers with a melting point or a glass transition temperature above about 130° C., which process comprises the steps of:

(a) providing one or more of such fibers in the form of an interlocked mass in a heated matched metal die mold in an amount such that from about 15 to about 80 weight percent of the fabricated fiber reinforced thermoset resin article is comprised of such fibers;

(b) providing in an accumulator zone a liquid body of a thermosettable organic material having a viscosity determined at 120° C., in the absence of curing agents therefor, of less than about 50 centipoise, and which is curable within three minutes upon heating to a thermoset resin composition, the viscosity of said liquid body being maintained essentially constant in the accumulator zone by keeping its temperature below that at which curing of said material is substantial;

(c) closing the mold containing the interlocked mass of fibers;

(d) continously injecting at least a portion of said thermosettable organic material under a substantially constant pressure of from about 2 to about 200 atmospheres from said accumulator zone into the closed mold to thereby fill the cavity in said mold;

(e) curing said thermosettable organic material at such a

temperature in said mold that said thermosettable organic material cures within about 3 minutes after being injected into the mold; and then

(f) opening said mold and removing the cured thermoset molded article therefrom.

4,692,292

PROCESS FOR THE MANUFACTURE OF MOLDED OBJECTS

Hans-Joachim Kollmeier, Essen, and Helmut Lammerting, Herbede, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Dec. 26, 1985, Ser. No. 813,667

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522659

Int. Cl.[4] **B27J** *5/00;* **B29C** *33/64, 43/00*

U.S. Cl. 264—126 **13 Claims**

1. In a process for the manufacture of molded objects wherein lignocellulose-containing materials with polyisocyanates as a binder are subjected to hot pressing in a caul or mold and wherein an agent is applied to the surface of the caul or mold to facilitate release of the molded article from the press, the improvement which comprises using as the release agent a mixture comprising

(a) 20 to 65 weight percent of a silicone resin of the general formula

$$(CH_3)_a-SiO_{\frac{4-(a+b)}{2}}-(OR^1)_b$$

in which

R^1 is a low molecular weight alkyl radical with 1 to 4 carbon atoms,

a has a value of 1 to 1.7,

b has a value of 0.3 to 1.0;

(b) 30 to 65 weight percent of an α,ω-methylsiloxanediol with an average molecular weight of 1,000 to 20,000;

(c) 5 to 15 weight percent of a silicate ester of the general formula

$$(R^2O)_cSiO_{\frac{4-c}{2}}$$

in which

R^2 is a low molecular weight hydrocarbon radical with 2 to 4 carbon atoms,

c has a value of 2.1 to 4.0;

wherein the sum of components (a), (b), and (c) amounts to 100, and after applying the mixture to the surface of the caul or mold, subjecting the mixture to curing at temperatures from 100° C. to 200° C.

4,692,293

MOLD METHOD FOR MULTI-COLOR PLASTIC SHELLS

John D. Gray, New Durham, N.H., assignor to Ex-Cell-O Corporation, Walled Lake, Mich.

Division of Ser. No. 794,805, Nov. 4, 1985, Pat. No. 4,634,360. This application Jun. 2, 1986, Ser. No. 869,789

Int. Cl.[4] **B29C** *39/12, 65/02*

U.S. Cl. 264—245 **3 Claims**

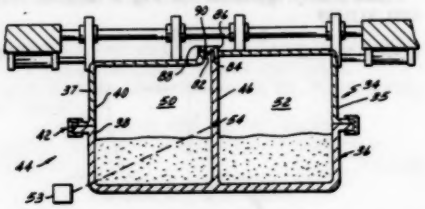
1. In a process for molding a single-piece multi-color plastic shell the steps comprising:

(1) heating an open-ended mold to a temperature near the melt temperature of a plastisol thermoplastic material;

(2) connecting a charge box to the mold to fold a closed system with at least two color plastisol sources;

(3) providing first and second split mold portions movable between clamping and unclamping positions with respect to a mold divider contained in the interior of the charge box; clamping said mold portions to the mold divider and charge box thereby defining the closed system including two chambers and first and second casting surfaces formed by the first and second mold portions and separated by the mold divider;

(4) thereafter rotating the charge box and mold in a plastisol casting sequency for releasing plastisol particles of a separate color onto each of the casting surfaces by gravity to



build up separate partially fused plastisol shells of desired shape and size on each of the split mold portions;

(5) separating the split mold portions for removal of the divider and charge box from the mold;

(6) and thereafter positioning the split mold portions together to clamp the separate partially fused shells together and finally fusing the shells to form an integral joint therebetween.

4,692,294

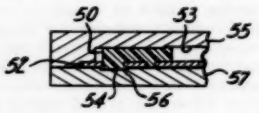
METHOD OF MOLDING AN INTEGRAL SPUR GEAR AND TOOTHED SPROCKET ASSEMBLY

Alfred J. Fisher, III, Grosse Pointe Farms, and Timothy J. Schmidt, Troy, both of Mich., assignors to General Safety Corporation, St. Clair Shores, Mich.

Division of Ser. No. 640,468, Aug. 13, 1984, Pat. No. 4,605,180. This application Apr. 3, 1986, Ser. No. 835,361

Int. Cl.[4] **B29C** *45/14*

U.S. Cl. 264—259 **4 Claims**



4. A method of manufacturing an integral spur gear and toothed sprocket assembly for use in an emergency locking seat belt retractor of the type having an inertia sensitive actuator which prevents seat belt webbing from being withdrawn when said retractor is subjected to deceleration above a predetermined level, wherein the method comprises the steps of:

providing a sprocket having radially outwardly projecting teeth and having a plurality of apertures through said sprocket which are radially spaced and positioned in a predetermined orientation with respect to said teeth of said sprocket,

inserting said toothed sprocket within an injection molding die cavity, said die cavity defining the configuration of said spur gear including a plurality of radially outward projecting spur gear teeth,

precisely positioning said toothed sprocket within said die cavity such that portions of said die cavity defining said spur gear teeth are in registry with said sprocket apertures,

injecting molding material within said die cavity such that said material defines said spur gear and flows through said sprocket apertures thereby interlockingly engaging each of said spur gear teeth with said sprocket, and

removing said integral spur gear and toothed sprocket assembly from said die cavity.

4,692,295

THERMOPLASTIC RESIN COMPOSITION FOR BIAXIAL ORIENTATION

Bernard Vinatier, Coye la Foret, France, assignor to Produits Chimiques Ugine Kuhlmann, France

Continuation of Ser. No. 605,577, Apr. 30, 1984, abandoned, which is a continuation of Ser. No. 446,457, Dec. 3, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 774,375
Claims priority, application France, Dec. 11, 1981, 81 23149
Int. Cl.[4] C08L *25/06, 25/08, 25/12, 27/06*
U.S. Cl. 264—291 **2 Claims**

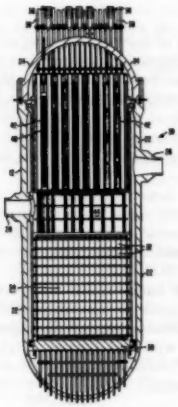
1. A process for biaxially orienting a non-foamed thermoplastic resin article comprising forming said article from an admixture of a thermoplastic resin selected from homopolymers and copolymers of vinyl chloride or acrylonitrile-butadiene-styrene copolymers capable of biaxial orientation and an additive resin having a molecular weight above 10^6 and selected from copolymers of styrene-acrylonitrile, methacrylonitrile-styrene, alpha methylstyrene-styrene-acrylonitrile, methyl acrylate-ethyl acrylate, methyl methacrylate-ethyl acrylate, methyl methacrylate-styrene-alpha methylstyrene, methyl methacrylate-alpha methylstyrene, or methyl methacrylate-styrene-acrylonitrile, said admixture requiring a lower force to stretch during orientation than a thermoplastic resin article absent the additive resin, heating said article to a temperature of from about 5° to 20° C. above the glass transition temperature of said thermoplastic resin, and biaxially orienting said thermoplastic resin composition at said temperature.

4,692,296

MECHANICAL SPECTRAL SHIFT REACTOR

Donald G. Sherwood, Monroeville; John F. Wilson, Murrysville; Robert B. Salton, and Howard F. Fensterer, both of Plum, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 564,363, Dec. 22, 1983, abandoned, which is a continuation of Ser. No. 217,053, Dec. 16, 1980, abandoned. This application Dec. 24, 1986, Ser. No. 946,111
Int. Cl.[4] G21C *7/26*
U.S. Cl. 376—209 **4 Claims**



1. A spectral-shift pressurized-water nuclear reactor comprising:

a vertically disposed elongated pressure vessel enclosing a reactor core which includes fissile material and fertile material and which generates heat by nuclear fission, said pressure vessel having an inlet and an outlet for circulating water coolant moderator upwardly through and in heat transfer relationship with said core, said core disposed toward the bottom portion of said reactor vessel and comprising a plurality of vertically disposed adjacent fuel assemblies, and said fuel assemblies having a fuel enrichment which provides a measure of excess reactivity at the beginning of core life which is later drawn upon to lengthen core life;

a plurality of spaced vertical guide tubes disposed in each of said fuel assemblies, and different types of rod members operable to be inserted into said guide tubes and said core and moved out of said guide tubes and said core during reactor operation;

one of said types of said rod members adapted to be inserted into said guide tubes comprising vertically disposed neutron-absorbing control rods so that insertion of said control rods into said core will substantially decrease reactivity and withdrawal of said control rods from said core will substantially increase reactivity, another of said types of said rod members adapted to be inserted into said guide tubes comprising vertically disposed neutron-spectral-shift displacer rods which have a substantially lower absorptivity for neutrons than said control rods, each said neutron-spectral-shift displacer rod comprising a hollow thin-walled Zircaloy member containing a filling of solid or annular zirconium- or aluminum-containing material for providing internal support and mass for said thin-walled tubular member, each said displacer rod having overall neutron-absorbing and -moderating characteristics essentially not exceeding those of hollow tubular Zircaloy members with or without a filling of zirconium oxide pellets or aluminum oxide pellets, said neutron-spectral-shift displacer rods collectively have a sufficiently low absorption for neutrons that when all of said neutron-spectral-shift displacer rods are fully inserted into said core at the beginning of core life, supplemental neutron-absorption is required to control reactor operation, said control rods and said neutron-spectral-shift displacer rods having approximately the same diameter, and the total number of said neutron-spectral shift displacer rods very substantially exceeding the total number of said control rods so that when all of said neutron-spectral-shift displacer rods are fully inserted into said core at the beginning of core life the neutron spectrum is hardened by the decreased volume of said water coolant moderator;

spider members and associated shafts and drive members therefor positioned above said core, each of said spider members connected to and supporting only one type of said rods by a series of strut members, and movement of said spider members operating to move said rods supported thereby into and out of said guide tubes in said core;

a plurality of rigidly restrained vertically disposed slotted guide tubes positioned above said core within said pressure vessel and operable to receive selected strut members of said spider members to retain the received strut members of said spider members and said rods connected thereto in their vertical path of movement;

a calandria positioned above the upper end of said core and beneath said slotted guide tubes, said calandria comprising a plurality of vertically positioned fixed unslotted tubes positioned at their lower ends directly over said guide tubes in said core and aligned at their upper ends to receive said rods, and said outlet of said pressure vessel positioned at the same elevation as said calandria so that during reactor operation said water coolant moderator moves upwardly through and from said fuel assemblies and is then changed in flow path to a lateral direction to discharge through said outlet in said pressure vessel; and

at the beginning of core life and throughout extended operation of said reactor said neutron-spectral-shift displacer rods are fully inserted into said core and are protected from possible vibrations induced by the lateral flow of said water coolant moderator by said calandria comprising said unslotted tubes, whereby the hardened neutron spectrum resulting from said fully inserted neutron-spectral-

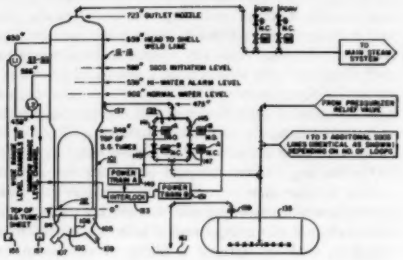
shift rods operates to convert fertile material to fissile material.

4,692,297

CONTROL OF NUCLEAR REACTOR POWER PLANT ON OCCURRENCE OF RUPTURE IN COOLANT TUBES

James S. Schlonski, Monroeville, and Tobias W. T. Burnett, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1985, Ser. No. 692,156
Int. Cl.[4] G21C *7/32, 19/42, 17/00, 9/00*
U.S. Cl. 376—211 **10 Claims**



1. The method of controlling the operation of a nuclear-reactor plant on the occurrence of rupture in the coolant channel of the steam generator which rupture raises the level of the liquid in said steam generator; the said method including the steps of:

(a) monitoring the level of the liquid in the vaporizing means of the steam generator, and

(b) when said level reaches a predetermining height , conducting said liquid to said pressurizer relief tank of said nuclear reactor plant to maintain the liquid in said vaporizing means at a predetermined level at which flooding of the steam line of the steam generator is precluded.

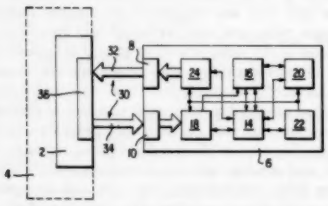
5. The method of claim **1** wherein the monitoring step includes the additional substeps of enabling an alarm when the liquid in the vaporizing means reaches a first predetermined level below the predetermined height, and thereafter enabling the conduction of the liquid to the pressuirzer relief tank when the predetermined height is thereafter reached, a predetermined time interval after the enabling of the alarm in the event of a rupture in the channel.

4,692,298

ANALOG PROCESS CONTROL SYSTEM TESTING

Michael D. Coradi, Harmar Township, Allegheny County, and Carl A. Vitalbo, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1985, Ser. No. 788,982
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—215 **12 Claims**



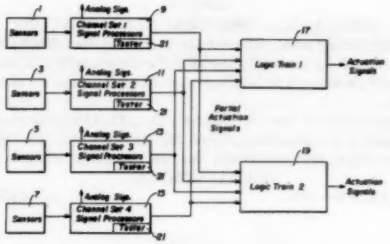
1. A method for testing an analog system which controls a process, the system being composed of a plurality of channels, with each channel having an input terminal normally connected for receiving a signal to be monitored, at least one signal monitoring component for deriving a control signal from the signal applied to the input terminal, and an output terminal normally connected in circuit with that at least one component for delivering the control signal to a further device for controlling the process, said method comprising testing each channel individually by: switching the channel input terminal to receive at least one test signal in place of the signal to be monitored; providing the at least one test signal to the channel input terminal; monitoring the response of the at least one component to the at least one test signal; and causing the channel output terminal to present a simulated control signal during the time when the channel input terminal is switched to receive the at least one test signal, the simulated control signal corresponding to the control signal produced when the input and output terminals have their normal connections, and the signal to be monitored has a value indicative of normal process operation.

4,692,299

TESTING SENSOR SIGNAL PROCESSORS

Albert W. Crew; William D. Ghrist, III, both of Pittsburgh, and Gilbert W. Remley, Blawnox, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1985, Ser. No. 788,983
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—216 **11 Claims**



1. A method of testing sensor signal processing apparatus which applies dynamic compensation defined by a predetermined non-linear transfer function to the sensor signal to generate a compensated signal and generates a digital output signal having a first level when the magnitude of the compensated signal is less than a set point value and a second level when it equals or exceeds the set point value, said method comprising the steps of:

generating a dynamic reference signal;

generating a test signal by applying to the dynamic reference signal, dynamic compensation defined by the inverse of the non-linear transfer function of the processing apparatus;

removing the sensor signal from the processing apparatus and applying in its place the test signal; and

comparing the compensated signal generated by the processing means with said dynamic reference signal.

4,692,300

DEVICE FOR THE UNDERWATER MEASUREMENT OF THE HARDNESS OF A VERTICAL WALL OF THE PARTITIONING OF THE CORE OF A PRESSURIZED WATER NUCLEAR REACTOR

Gerard Grespin, Paris, France, assignor to Framatome & Cie., Courbevoie, France

Filed Nov. 2, 1984, Ser. No. 667,692
Claims priority, application France, Nov. 4, 1983, 83 17524
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—245 **6 Claims**

1. Underwater measuring device, for the hardness of a verti-

cal wall of the partitioning of the core of a pressurized water nuclear reactor comprising vertical partitions arranged in parallel and facing pairs and each assembled at a right angle with other vertical walls of the partitioning, said device comprising:

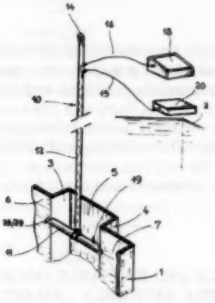
a hollow pole for the manipulation of the device from the edge of the pool of the reactor, the pole being vertical in service position,

a body fastened to the pole at its lower end having an axis perpendicular to the pole and hence horizontal in service position,

a first chamber formed in the horizontal body along its axis and at one of its ends,

a first piston mounted axially movable in the first chamber bearing a support means intended to come into contact with a first set of two walls aranged at right angles,

a second chamber formed in the horizontal body, along its axis and at its end opposite the first chamber,



a second piston mounted axially movable in this second chamber bearing a hardness measuring head intended to come to make an impression on one of the walls opposite the support walls, the horizontal body being intercalated between these opposite walls during the hardness measurement,

hydraulic fluid supply means for each of the chambers of the horizontal body passing axially through the hollow vertical pole,

measuring means for the stress exerted by the second piston on the hardness measuring head,

accurate measuring means of the movement of the measuring head,

and conductors passing axially through the vertical pole for the transmission of the measuring results to a measuring station arranged above the pool of the reactor.

4,692,301

STEAM GENERATOR HEATED WITH THE COOLING GAS OF A NUCLEAR REACTOR

Josef Schoening, Hambucken; Claus Elter, Bad Durkheim, and Jürgen Rautenberg, Stettfeld, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Dortmund, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,922

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418528

Int. Cl.[4] G21D *5/12*

U.S. Cl. 376—391 **14 Claims**

1. A steam generator heated with cooling gas of a nuclear reactor, arranged in a vertical shaft clad with a metal liner in a reactor pressure vessel, with a blower following in line and installed above the steam generator in the vertical shaft, comprising:

a cold gas conduit and a hot gas conduit entering the vertical shaft, the hot gas conduit serves to supply hot gas and the cold gas conduit serves to remove cold gas from the steam generator wherein the cold gas conduit is positioned above the hot gas conduit;

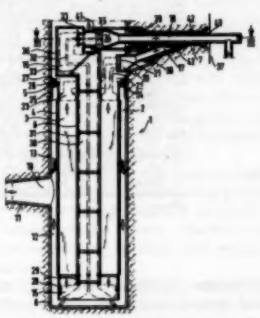
feed water and live steam lines leading out of the reactor pressure vessel, connected to heat transfer surfaces laid out as a helical bundle and surrounded by a bundle jacket of the steam generator open in a downward direction and not extending to the bottom of the shaft wherein the heat transfer surfaces extend past an inlet location of the hot gas conduit;

a reversing area located between a lower end of the bundle and the bottom of the shaft, defined by a downward extension of the bundle jacket;

an annular canal for conducting the hot gas in a downward direction, formed between the metal liner and the bundle jacket;

means for blocking upward flow of cooling gas and performing earthquake support functions of said steam generator and comprising a sliding gasket in the annular canal positioned directly above the inlet location of the hot gas conduit between the metal liner and the bundle jacket;

wherein the feed water line and the live steam line lead out



laterally from the vertical shaft and through the reactor pressure vessel in an upper portion or cold gas range of the steam generator between said blower and an upper end of said bundle, and that the bundle of heat transfer surfaces are made up of individual tubes;

a center tube arranged within said helical bundle and surrounding a straight tube bundle of said individual tubes deflected 180° from said helical bundle in said reversing area;

a perforated plate, welded to said center tube, traversed by said straight tube bundle and arranged to block flow of cooling gas into said center tube;

a plurality of recycling tubes, arranged in an expansion zone, connecting said straight tube bundle to said live steam lines;

an insulated sheet metal jacket surrounding said expansion zone, connected to said center tube;

means for immobilizing said individual tubes comprising a plurality of vertical support plates with upper ends welded on top of the bundle jacket and said center tube, a support flange on the metal liner of the vertical shaft supporting an upper end of said bundle jacket.

4,692,302

COOLANT FLOW MIXER GRID FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Edmund E. DeMario, Penn Hills; Raymond F. Boyle, Monroeville, and Peter J. Kuchirka, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1983, Ser. No. 567,450

Int. Cl.[4] G21C *3/34*

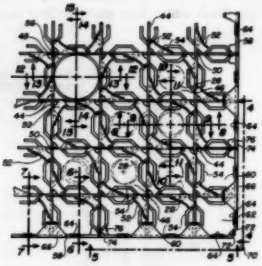
U.S. Cl. 376—439 **3 Claims**

1. In a nuclear reactor fuel assembly including a number of

longitudinally extending control rod guide thimbels, and a plurality of transverse grids axially spaced along said thimbles for supporting an array of upstanding fuel rods, a flow mixing nonsupport grid structure mounted on said thimbles and disposed between a pair of adjacent fuel rod support grids for promoting the mixing of a coolant as it flows longitudinally upwardly along and between the fuel rods, said grid structure comprising:

(a) a plurality of inner interleaved straps arranged in an egg-crate configuration in defining a plurality of inner cell openings for receiving therethrough respective ones of said fuel rods;

(b) at least one mixing vane mounted on one of the inner straps associated with each inner cell opening having a fuel rod extending therethrough, said mixing vane projecting upwardly and inwardly toward the longitudinal axis of said cell opening for deflecting the upwardly flowing coolant laterally from one fuel rod to an adjacent fuel rod; and



(c) a protrusion associated with each mixing vane and mounted on said inner strap and extending into said cell opening toward said longitudinal axis of said cell to a greater extent than said mixing vane so as to prevent damaging impact of said fuel rod with said vane, but not so far as to normally contact the fuel rod, should said fuel rod move transversely across said cell opening, the distance across each said inner cell opening between said interleaved straps with said protrusion mounted thereon being greater than the diameter of said one fuel rod received through said inner cell opening such that said fuel rod is unsupported within said cell opening, said protrusion being a generally transversely running arch which is rigid and generally trapezoidal shaped, projects generally perpendicularly toward said longitudinal axis of said cell opening and is oriented to permit the upwardly flowing coolant to pass therethrough in thereby reducing the pressure drop of said coolant flow through said grid structure.

4,692,303

SPACER CAPTURE ROD TO SPACE GRID ATTACHMENT DEVICE

Jon L. Osborne, West Richland, Wash., assignor to Exxon Nuclear Company, Inc., Florham Park, N.J.

Filed Aug. 23, 1984, Ser. No. 643,440
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **9 Claims**

1. In a nuclear fuel assembly having a parallel array of fuel rods, at least one of said fuel rods serving as a spacer capture rod, said fuel rods being positioned for longitudinally extending through openings formed from intersecting walls of a grid spacer, some of said walls being flat and others of said walls having protrusions extending into said openings and coacting springs for holding said fuel rods in laterally fixed positions, said protrusions and springs being horizontally and vertically oriented, relative to the longitudinal axes of said fuel rods, a spacer capture system which secures said grid spacer in fixed position relative to said fuel rods, comprising a cylindrical-like sleeve rigidly fixed to said spacer capture rod, said sleeve including:

a longitudinal guide slot; and

a plurality of spaced apart horizontally oriented pairs of vertically opposed bosses extending radially outward from the outer face of an upper portion of said sleeve for engaging at least one of said protrusions from said grid

spacer walls between one of said pair of bosses such that movement of said grid spacer in either longitudinal direction is substantially prevented and the vertical location of said spacer grid is fixed; and

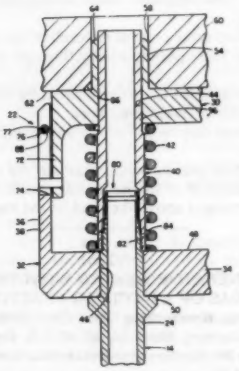
at least one vertically oriented slot located in a lower portion of said sleeve for receiving and locking against one of said springs, the coaction therebetween substantially preventing axial rotation of said capture rod relative to said grid spacer.

4,692,304

REMOVABLE AND REUSABLE LOCKING PIN FOR TOP NOZZLE ASSEMBLY AND DISASSEMBLY

Robert K. Gjertsen, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1985, Ser. No. 812,041
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **13 Claims**



1. In fuel assembly top nozzle, the combination comprising:

(a) a lower adapter plate;

(b) an upper hold-down plate;

(c) resilient means disposed between said lower and upper plates so as to bias said plates to move away from one another, but being yieldable so as to permit said plates to move toward one another;

(d) a first structure mounted on said lower plate and extending toward said upper plate;

(e) a second structure mounted on said upper plate and extending toward said lower plate and along said first structure;

(f) means defining at least one slot in one of said first and second structures so as to extend toward said lower and upper plates;

(g) at least one protruding element attached on the other of said first and second structures and extending into said slot, said protruding element being slidably moved along said slot as said lower and upper plates move toward and away from one another; and

(h) closure means mounted to said one of said first and second structures containing said slot, said closure means defining an end of said slot so as to limit the extent of movement of said protruding element along said slot in a direction in which said plates move away from each other and thereby prevent disassembly of said lower and upper plates from one another, said closure means being releasable and reusable for permitting opening of said slot end for facilitating disassembly of said plates from one another and then reassembly of said plates back together.

4,692,305

CORROSION AND WEAR RESISTANT ALLOY

Subramaniam Rangaswamy, Port Jefferson Station, and John H. Harrington, Warwick, both of N.Y., assignors to Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 5, 1985, Ser. No. 795,057

Int. Cl.[4] C22C *19/05, 19/07, 30/00*

U.S. Cl. 420—436 **12 Claims**

1. An alloy characterized by high resistance to wear and corrosion, consisting essentially of, as percent by weight:

2 to 25% chromium,

5 to 30% molybdenum,

3 to 15% tungsten,

2.0 to 8% copper,

0.2 to 2.0% boron, and

0.2 to 2.0% carbon;

the balance being incidental impurities and at least 30% of a metal selected from the group consisting of nickel, cobalt and combinations thereof; and the total of molybdenum and tungsten being at least 16%.

4,692,306

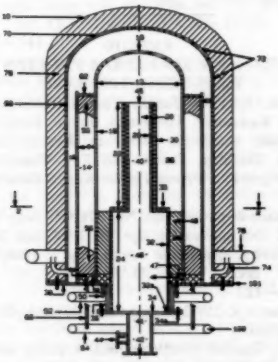
CATALYTIC REACTION APPARATUS

Ronald G. Minet, South Pasadena, and David Warren, Studio City, both of Calif., assignors to Kinetics Technology International Corporation, Monrovia, Calif.

Filed Mar. 24, 1986, Ser. No. 842,830

Int. Cl.[4] B01J *7/00, 8/06*

U.S. Cl. 422—49 **17 Claims**



1. Endothermic catalytic reaction apparatus comprising:

(a) an axially extending reaction chamber, and an axially extending regenerative heat transfer chamber,

(b) an internally disposed, axially extending burner chamber about which the reaction chamber extends, the burner chamber containing an infrared burner assembly, means defining a radiant chamber, and means defining a convection chamber wherein said burner chamber supplies endothermic reaction heat to the reaction chamber, said burner chamber defined by a generally cylindrical inner wall means of said reaction chamber, said burner chamber also including burner gas exhaust means associated therewith,

(c) said axially extending reaction chamber being disposed generally concentrically about said burner chamber, said reaction chamber defined by said inner wall means which is exposed to burner gases within said burner chamber and also by a generally concentric cylindrical outer wall means exposed to hot product gases within said regenerative heat transfer chamber, there being a first space between said reaction chamber inner and outer wall means defining a generally annular chamber which is substantially filled with catalyst and which is a passageway for conducting reactant gases over said catalyst,

(d) said axially extending regenerative heat transfer chamber disposed in a generally concentric arrangement about said reaction chamber, said regenerative heat transfer chamber defined by said outer wall means of the reaction chamber and by a generally concentric cylindrical outer shell means of the catalytic reaction apparatus, there being a second space between said outer wall means and said outer shell means defining a generally annular passageway for flow of said hot product gases,

(e) said infrared burner assembly comprising an upper radiant burner portion and a lower burner stock portion, said radiant burner portion being vertically disposed within said radiant chamber of the burner chamber, and said burner stock portion defining an inner wall means of said convection chamber,

(f) and wherein said radiant burner portion comprises a gas permeable support structure having an internal volume defining a burner core and wherein said support structure includes a ceramic fiber material defining a radiant skin enclosing a substantial portion on said support structure.

4,692,307

ADJUSTABLE TEST PACK

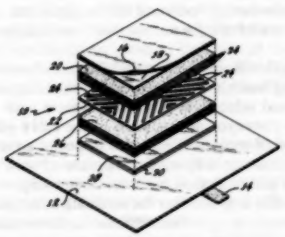
Loran H. Bruso, Ontario, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 605,084, Apr. 30, 1984, Pat. No. 4,576,795, which is a continuation-in-part of Ser. No. 536,798, Sep. 28, 1983, Pat. No. 4,579,715. This application Sep. 23, 1985, Ser. No. 779,175

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] G01N *21/78*

U.S. Cl. 422—58 **5 Claims**



1. A disposable pack for testing the efficiency of a steam sterilizer apparatus to create a vacuum which comprises:

a porous bundle comprising a plurality of selectively porous

layers wherein said bundle has a top surface and a bottom surface with an edge therebetween;

a first nonporous gas impermeable layer positioned against said top surface of said bundle to block the passage of gas therethrough;

a porous sheet with a steam sensitive indicator ink printed thereon positioned between layers of said bundle to indicate the efficiency of a sterilizer;

a foam layer positioned against said bottom surface of said bundle having an edge substantially aligned with the edge of said bundle to permit circulation of gas over said bottom surface;

a second nonporous gas impermeable layer positioned against said foam layer opposite said bundle to direct the passage of air through the edge of said foam layer; and

a porous overwrap folded around said bundle, said sheet, said foam layer, said first nonporous gas impermeable layer, and said second nonporous gas impermeable layer to maintain the integrity thereof.

4,692,308

AUTOMATIC CHEMICAL ANALYSIS

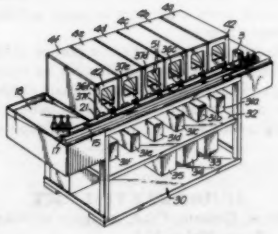
Clifford Riley, Burgess Hill, and Christopher J. Mears, Guilford, both of United Kingdom, assignors to Vickers, PLC, London, England

Continuation of Ser. No. 525,818, Aug. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 493,382, Mar. 17, 1983, abandoned. This application Feb. 7, 1986, Ser. No. 827,151

Claims priority, application United Kingdom, Mar. 17, 1982, 8207814

Int. Cl.[1] G01N *35/04*

U.S. Cl. 422—65 **14 Claims**



1. Automatic analysis apparatus, comprising:

a first endless conveyor;

a second endless conveyor being disposed in a side by side relationship with said first endless conveyor; such that respective longitudinal side edges of said first and second endless conveyors are adjacent to one another;

means for driving said first and second endless conveyors continuously and in first and second respectively opposite directions during operation of the apparatus;

means for transferring a sample vial from said second endless conveyor to said first endless conveyor;

an entry gate disposed along said first endless conveyor, for retaining sample vials carried by the first endless conveyor and selectively admitting sample vials to the first endless conveyor downstream of the entry gate;

a plurality of analytical modules disposed adjacent to said first endless conveyor, downstream of said entry gate, each of said analytical modules comprising:

a moveable stop member for retaining a sample vial on the conveyor in a position adjacent to the module; a sample probe for removing sample from a vial retained by the stop member;

means for moving the sample probe between a first operative position in which the probe may be inserted into a vial held by said stop member to remove sample therefrom and a second operative position in which the sample probe is clear of the vial;

means for processing a sample removed by the sample probe; and

means for controlling the movement of the stop member to enable it to retain a sample vial to allow a sample to be removed therefrom and to release the vial when the sample has been removed therefrom;

identification means adjacent said entry gate for reading an identifying code carried by a sample vial; and

synchronizing means for controlling the operation of the entry gate, the identification means, the means for moving the sample probe and the means for controlling the stop member, wherein the synchronizing means and the identification means are arranged so that information carried by a vial can be processed to determine the modules to which the vial is to be directed, thereby allowing selective testing of the sample in the vial.

4,692,309

DIFFUSION SAMPLE COLLECTOR FOR GASEOUS MEDIA

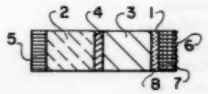
Karl-Heinz Pannwitz, Lübeck, Fed. Rep. of Germany, assignor to Dragerwerk AG, Fed. Rep. of Germany

Filed Sep. 8, 1986, Ser. No. 904,888

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531650

Int. Cl.[4] G01J *1/48*

U.S. Cl. 422—87 **6 Claims**



1. Diffusion sample collector and indicator arrangement for gas components in gaseous media, comprising in combination

a transparent container having an opening at both ends,

a non-permeable wall between the ends and dividing the container into two separate compartments, each compartment communicating with a separate open end,

an indicator layer of material in one of the compartments for indicating the effect of a gas component to which the indicator layer is exposed, and

a collector layer of material in the other of the compartments for collecting a gas component whose quantity is to be later determined upon the presence of such gas component being indicated by the indicator layer in the one of the compartments.

4,692,310

SUBSTANCE K-259-2 AND A PROCESS FOR PRODUCING THE SAME

Hiroshi Kase, Koganei, Japan; Yuzuru Matsuda, Rockville, Md.; Isao Kawamoto, Hiratsuka, Japan; Kozo Asano, Machida, Japan; Kunikatsu Shirahata, Komae, Japan; Tohru Yasuzawa, Machida, Japan, and Koji Yamada, Machida, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 771,530, Aug. 30, 1985, abandoned. This application Apr. 16, 1986, Ser. No. 852,590

Claims priority, application Japan, Sep. 3, 1984, 59-184320

Int. Cl.[4] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—122 **5 Claims**

1. A substance K-259-2 having the following physico-chemical characteristics:

(1) Nature: Reddish needle crystal. Alkaline substance.

(2) Melting point:

140°–145° C. (decomp.). Becomes brownish at a temperature of more than about 140° C. Melting point indefinite.

(3) Specific rotation:
$[\alpha]_D^{20} = 0°$ (c=0.33, CH_3OH)
(4) Solubility:
Readily soluble in acetic acid, soluble in methanol and water, and hardly soluble in chloroform, ethyl acetate, acetone and ethanol.
(5) Color reaction:
Positive in iodine and anisaldehyde reactions.
(6) Visible absorption spectrum:
As shown in FIG. 1 (82% methanol-water, v/v)
(7) Ultraviolet absorption spectrum:
As shown in FIG. 2 (82% methanol-water, v/v)
(8) Infrared absorption spectrum:
3425, 2960, 2924, 2852, 1626, 1562, 1442, 1386, 1326, 1259, 1227, 1176, 1157, 1108, 1052, 1023 cm^{-1}
(KBr method)
(9) Mass spectrum:
382 (M^+), 353, 334, 311, 308, 268.
(10) ^1H-NMR spectrum (100 MHz, DMSO-d_6+CD_3OD, δ):
0.78 (3H, t, J=7.3), 1.67 (3H, br.d, J=5.9), ca. 1.7 (2H, m), 4.38 (2H, br.s), ca. 5.1 (1H, m), 6.36 (1H, d, J=2.4), 6.93 (1H, d, J=2.4), 7.36 (1H, s).
(11) Molecular formula: $C_{21}H_{18}O_7$
(12) Molecular weight: 382

	H	C	N	O
Found:	4.50	65.53	0	
Calculated ($C_{21}H_{18}O_7$)	4.71	65.97	0	29.32

(14) Rf values obtained by silica gel thin layer chromatography:

Solvent system	Rf value*
1. Chloroform/methanol/ethanol/water = 10:4:4:2 (v/v)	0.56
n-butanol/ethanol/chloroform/ aqueous ammonium (28%) = 4:5:2:4 (v/v)	0.35

*Thin layer . . . Kieselgel 60 (Art 5631, product of Merck AG., West Germany)

4,692,311

APPARATUS FOR THE SEPARATION OF FLUID CRACKING CATALYST PARTICLES FROM GASEOUS HYDROCARBONS

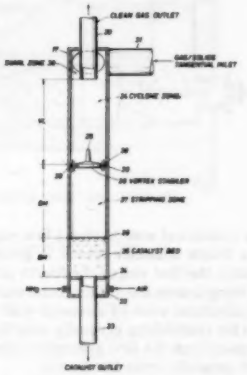
Wesley A. Parker; Thomas S. Dewitz; George P. Hinds, Jr., all of Houston; John E. Gwyn, Katy; A. Haluk Bilgic, Houston, and Donald E. Hardesty, La Porte, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 452,599, Dec. 23, 1982, Pat. No. 4,455,220. This application Feb. 10, 1984, Ser. No. 878,321
Int. Cl.[4] F27B *15/08*; C10G *11/18*
U.S. Cl. 422—144 **6 Claims**

1. An apparatus for separating suspensions of catalyst particles and gaseous hydrocarbons and for stripping hydrocarbons from said catalyst particles after traversing a riser conduit which comprises:

(a) an upright hollow housing having a lower portion, a middle portion an upper portion, a gaseous hydrocarbon vortex outlet with a diameter in said upper portion of said housing for removing clean gaseous hydrocarbons, and a stripped catalyst outlet means in said lower portion of said housing for removing stripped catalyst, said housing having a tangential inlet means in said upper portion to form a swirl zone wherein suspensions of catalyst particles and gaseous hydrocarbons entered through said inlet means form a fluix vortex;

(b) a vortex stabilizer means having a perimeter and coaxially mounted in said middle portion of said housing and having a diameter of at least the diameter of said gaseous hydrocarbon vortex outlet and positioned a distance from said gaseous hydrocarbon vortex outlet means to define a cyclone zone, wherein catalyst particles are separated from gaseous hydrocarbons to form a clean fluid, wherein said vortex stabilizing means stabilizes and centers said vortex to minimize reentrainment of said particles into said clean gaseous fluid, wherein said vortex stabilizing means is spaced a distance equal to a distance of at least two of said gaseous hydrocarbon vortex outlet diameters below said hydrocarbon vortex outlet and wherein said vortex stabilizer means is supported, by vortex stabilizer support means in said housing to provide an annular space intermediate said perimeter of said vortex stabilizer means and said housing sufficient to pass separated catalyst downward through said annular space into a stripping zone and pass stripping gas upward through said annular space into said cyclone zone;



(c) means for supporting a fluidized catalyst bed below said vortex stabilizer means near said bottom of said hollow housing and having a fluidized bed of catalyst being supported thereon and defining, intermediate said fluidized catalyst support means and said vortex stabilizer means, a stripping zone in gaseous communication with said cyclone zone through said annular space and including a catalyst disengaging space of sufficient height to avoid slugs of catalyst carryover into said cyclone zone and where, in said stripping zone, gaseous hydrocarbons are stripped from the catalyst particles to thereby terminate cracking reactions of said hydrocarbons; and

(d) means for injecting stripping gas into said fluidized catalyst to minimize adsorbed hydrocarbons on the catalyst particles.

4,692,312

APPARATUS FOR PRODUCING CARBON BLACK

Meredith N. Dilbert, Orange, Tex.; Glenn J. Forseth; William R. Jones, Jr., both of Bartlesville, Okla., and Richard T. Divis, Orange, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 652,027, Sep. 19, 1984, Pat. No. 4,582,695. This application Apr. 14, 1986, Ser. No. 851,999
Int. Cl.[4] C09C *1/48*
U.S. Cl. 422—151 **5 Claims**

1. A carbon black reactor comprising a means for defining a reaction flow path having the following zones, (a)–(e), in sequential, generally axial alignment along a reactor axis:

(a) a first generally cylindrical zone having a first end and a second end and a first diameter;

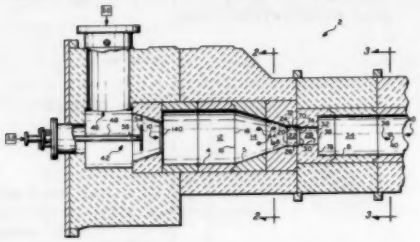
(b) a first converging zone having a first end and a second end, with the first end of the first converging zone being connected to the second end of the first generally cylindrical zone;

(c) a second generally cylindrical zone having a first end and

a second end and a second diameter, with the first end of the second generally cylindrical zone being connected to the second end of the first converging zone;

(d) a third generally cylindrical zone which forms a throat of the reaction flow path, said third generally cylindrical zone having a first end and a second end and a third diameter which is less than the second diameter, said third diameter being in the range of from about 4 inches to about 16 inches, with the first end of the third generally cylindrical zone being connected by a first wall means to the second end of the second generally cylindrical zone;

(e) a fourth generally cylindrical zone which forms the pyrolysis zone of the reaction flow path, said fourth generally cylindrical zone having a first end and a second end and a fourth diameter which is greater than the third diameter, the first end of the fourth generally cylindrical zone being connected to the second end of the third generally cylindrical zone by a second wall means;



a means for establishing generally axial flow of hot combustion gases from the first generally cylindrical zone to the fourth generally cylindrical zone;

a means for introducing a carbonaceous feedstock generally radially inwardly into the hot combustion gases along the reaction flow path;

and a means for introducing a quench fluid into the pyrolysis zone, said means for introducing the quench fluid defining the second end of the pyrolysis zone.

4,692,313

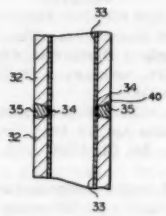
APPARATUS FOR THERMAL CRACKING OF OR HEATING OF HYDROCARBONS

Yoji Watanabe, Oita; Toshio Morimura, Kawaguchi, and Yukio Toyoda, Oita, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 331,782, Dec. 17, 1981, Pat. No. 4,454,021. This application Apr. 6, 1984, Ser. No. 597,314

Int. Cl.[4] **B01J** *19/02;* **C10G** *9/12;* **C01G** *9/16*

U.S. Cl. 422—241 **6 Claims**



1. An apparatus for heating of hydrocarbons, comprising a radiation chamber for thermal cracking of starting hydrocarbons, a convection chamber communicating with said radiation chamber, a preheating conduit for starting hydrocarbon extending from a source of starting hydrocarbons into said convection chamber, a steam conduit communicating with said preheating conduit, a thermal cracking reaction conduit having at least the inner surface thereof made of one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels for preheated starting hydrocarbons located in said radiation chamber, and a heat recovery device made of one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels communicating with said cracking reaction conduit via an intermediate conduit made of one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels, wherein a carbon-deposition-suppressing amount of at least one member selected from the group consisting of an alkali metal, an alkaline earth metal, an alkali metal-oxide and an alkaline earth metal-oxide is incorporated, as one of a solid solution and dispersed phase into at least an inner surface portion of said one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels of said thermal cracking reaction conduit, said heat recovery device and said intermediate conduit.

4,692,314

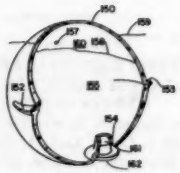
WATER TREATMENT SYSTEMS

Kenji Etani, P.O. Box 102, West Townsend, Mass. 01474

Continuation-in-part of Ser. No. 40,302, May 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 934,425, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 717,514, Aug. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,536, Jun. 30, 1975, abandoned. This application Apr. 22, 1983, Ser. No. 488,597 The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.[4] **C23F** *11/00;* **B01D** *11/02, 35/00;* **C02F** *1/68*

U.S. Cl. 422—265 **26 Claims**



1. A water treatment system for utilization apparatus comprising

(a) a pump;

(b) an intermediate velocity chamber;

(c) piping to interconnect pump, chamber, and utilization apparatus in a recirculating loop;

(d) a quantity of water within said pump, chamber, piping, and apparatus; and

(e) a feeder within said chamber comprising a shell containing a dose of water-treatment chemical;

(f) wherein said feeder is small enough and close enought to spherical in shape and to neutral buoyancy, dependent on the velocity of flow with said chamber, resulting from the operation of said pump, to be free to move about and roll in said water when said water is circulated by said pump, and

(g) wherein said feeder is of a volume between 0.1 and 24 cubic inches, and is perforated by a plurality of holes each less than 1/10 and greater than five thousandths of an inch (0.005") in diameter to control the feeding of said chemical to a proper rate.

4,692,315

METHOD OF INHIBITING CORROSION IN AQUEOUS SYSTEMS

Brian Greaves, and Paul Ingham, both of Runcorn, England, assignors to Dearborn Chemicals Limited, Widnes, England

Filed Apr. 17, 1985, Ser. No. 724,229

Claims priority, application United Kingdom, Apr. 25, 1984, 8410589

Int. Cl.[4] C23F 11/14, 11/08

U.S. Cl. 422—18 44 Claims

1. A method for inhibiting corrosion in an aqueous system which comprises adding to the system at least one corrosion inhibiting zinc salt capable of forming a passivating film of a water insoluble salt of zinc at the cathode, and adding to the system a substantially linear cationic polymer having a molecular weight between about 400 and about 10,000; said polymer containing quaternary ammonium groups or protonated amine groups and being derived from reacting epichlorohydrin with amines selected from the group consisting of dimethylamine, triethanolamine, ethylene diamine and polyalkylene polyamines; and said polymer being added in an effective amount to significantly reduce the amount of said salt needed in the system for corrosion protection.

4,692,316

METHOD OF INHIBITING CORROSION IN AQUEOUS SYSTEMS

Brian Greaves, Runcorn, and Stuart J. Grenside, Gateacre, both of England, assignors to Dearborn Chemicals Limited, Widnes, United Kingdom

Filed Mar. 20, 1985, Ser. No. 713,934

Claims priority, application United Kingdom, Mar. 20, 1984, 8407150

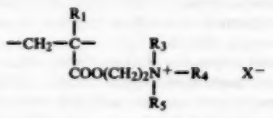
Int. Cl.[4] C23F 11/14, 11/18

U.S. Cl. 422—16 48 Claims

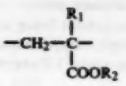
1. A method for inhibiting corrosion in an aqueous system which comprises adding to the system at least one corrosion inhibiting salt capable of forming a passivating film at the anode selected from the group of salts consisting of 2-phosphono-butane-1,2,4-tricarboxylic acid salts, orthophosphates, nitrites, and chromates, and a substantially linear cationic polymer having a molecular weight between about 400 and about 10,000; said polymer containing quaternary ammonium groups or protonated amine groups and being derived from reacting epichlorohydrin with amines selected from the group consisting of dimethylamine, triethanolamine, ethylene diamine and polyalkylene polyamines; and said polymer being added in an effective amount to significantly reduce the amount of said salt needed in the system for corrosion protection.

26. A method for inhibiting corrosion in an aqueous system which comprises adding to the system a corrosion inhibiting orthophosphate salt capable of forming a passivating film at the anode, and a substantially linear cationic polymer having a molecular weight between about 400 and about 10,000; said cationic polymer being derived by polymerizing ethylenically unsaturated monomers and incorporating quaternary ammonium groups or protonated amine groups therein, and said polymer being selected from the group consisting of

(i) polymers containing 10 to 100 mol % of recurring units of the formula:

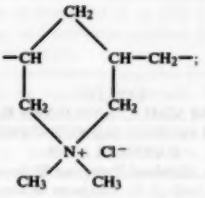


and 0 to 90 mol % of recurring units of the formula:



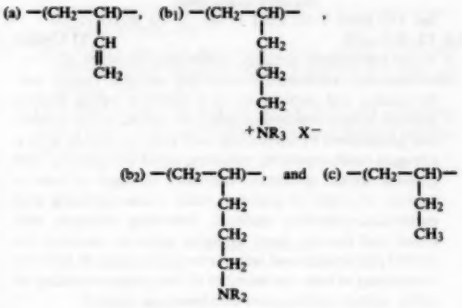
in which R_1 represents hydrogen or a lower alkyl radical, R_2 represents a long chain alkyl group having 8 to 18 carbons, R_3, R_4, and R_5 independently represent hydrogen or a lower alkyl group while X represents a anion;

(ii) polymers possessing recurring units of the formula;



and

(iii) polymers possessing recurring units of:



in the molar proportions $a:b_1:b_2:c$ respectively, where each R independently represents a lower alkyl radical; and said polymer being added in an effective amount to significantly reduce the amount of said salt needed in the system for corrosion protection.

4,692,317

CORROSION CONTROL IN AQUEOUS SYSTEMS USING CATIONIC POLYMERS IN COMBINATION WITH PHOSPHONOHYDROXYACETIC ACID

Brian Greaves, Runcorn, England, assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,933

Claims priority, application United Kingdom, Nov. 8, 1984, 8428258

Int. Cl.[4] C23F 11/16

U.S. Cl. 422—15 42 Claims

1. A method for inhibiting corrosion of steel and the like in an aqueous system which comprises adding to the system phosphonohydroxyacetic acid or a salt thereof and a cationic polymer having a molecular weight between about 400 and about 10,000; said cationic polymer being selected from the group consisting of

(a) polymers derived by polymerizing ethylenically unsaturated monomers and incorporating quaternary ammonium groups or protonated amine groups therein, and

(b) polymers containing quaternary ammonium groups or

protonated amine groups and derived from reacting epichlorohydrin with amines; and

the cationic polymer component being added to the system in a weight ratio to the phosphonohydroxyacetic acid component in the system of between about 1:8 and about 2:1.

4,692,318

PROCESS FOR SIMULTANEOUSLY REMOVING NITROGEN OXIDES, SULFUR OXIDES, AND PARTICULATES

Thomas W. Tolpin, Highland Park, and Richard A. Kretchmer, Clarendon Hills, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 640,675, Aug. 13, 1984, Pat. No. 4,609,537. This application Mar. 6, 1986, Ser. No. 836,687

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] B01J *8/00;* **C01I** *17/00, 21/00;* **B01D** *45/00*

U.S. Cl. 423—239 **11 Claims**

1. A gas purification process, comprising the steps of:

simultaneously substantially removing nitrogen oxides, sulfur oxides, and particulates in a common vessel from a gaseous stream containing nitrogen oxides, sulfur oxides, and particulates by contacting said gaseous stream with a nitrogen oxide-capturing reducing agent and passing said gaseous stream generally vertically through at least a portion of a bed of granular sulfur oxide-capturing and particulate-removing material, liberating nitrogen and steam and leaving spent granular material carrying removed particulates and sulfur-containing deposits thereon comprising at least one member of the group consisting of sulfur oxides, sulfates, and combinations thereof;

said sulfur oxide-capturing and particulate-removing material being selected from the group consisting essentially of adsorbers and adsorbers with at least one promoter thereon, said adsorbers comprising an oxide of at least one metal selected from the group consisting of aluminum, bismuth, manganese, yttrium, antimony. tin, rare earth metals, Group 1*a* metals, and Group 2*a* metals, and said promoter comprising at least one member, in a free or combined form, selected from the group consisting of rare earth metals, Group 8 noble metals, chromium, vanadium, rhenium, antimony, silver, and combinations thereof;

said nitrogen oxides being substantially removed by a nitrogen oxide-capturing reducing agent selected from the group consisting essentially of hydrogen, ammonia, ammonia-liberating compounds, light hydrocarbon gases, and combinations thereof;

simultaneously removing said particulates and sulfur-containing deposits from said spent material in a regenerator while converting said sulfur-containing deposits to hydrogen sulfide in said regenerator by reacting said spent material with a regenerating reducing gas selected from the group consisting essentially of hydrogen, ammonia, ammonia-liberating compounds, carbon monoxide, gas oils, light hydrocarbon gases, and combinations thereof, to provide regenerated material for use in said bed; and

feeding said regenerated material directly from said regenerator to said bed in said vessel without substantially heating, cooling, or tempering said regenerated material.

4,692,319

METHOD FOR DESULFURIZING FLUE GAS IN FUEL OIL FIRING SYSTEMS

Zoltan Farago, Adelsheim-Sennfeld, and Winfried Buschulte, Neuenstadt, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuch-Sanstalt für Luft- und Raumfahrt E.V., Bonn, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,162

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401471

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—242 **5 Claims**

1. A process for separating sulfur dioxide from flue gas in household fuel oil firing systems having a fuel oil burner, a boiler heated by said burner, a heating water return conduit and a residual heat exchanger connected to the output side of said boiler for cooling said flue gas to about 30°–35° C. and heating thereby the water in said return conduit, said residual heat exchanger forming condensate water in cooling said flue gas, comprising the steps of:

dissolving the sulfur dioxide in the form of sulfite solely in said condensate water formed in said residual heat exchanger without additional water supply;

adding a neutralising agent to said condensate water containing said sulfite to bring the pH of said condensate water in the range of 5 to 8;

recirculating said neutralised condensate water by a pump to the residual heat exchanger for the purpose of avoiding formation of acid condensate water and dissolving further sulfur dioxide;

introducing air into said recirculated condensate water to convert the dissolved sulfite to sulfate;

diluting the recirculating condensate with water once it reaches a predetermined sulfate concentation; and

exhausing said diluted surplus condensate water containing said sulfate.

4,692,320

METHOD OF MAKING OXYNITRIDES

Elaine C. Beckwith, Riverview, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1985, Ser. No. 813,169

Int. Cl.[4] C01F *17/00*

U.S. Cl. 423—263 **9 Claims**

1. A method of making a ultrapure silicon yttrium oxynitride, comprising the steps of:

(a) heating hydrated yttrium nitrate in an inert flowing atmosphere to a molten condition and to a temperature just below its dehydration temperature to form a dehydrated yttrium-nitrogen-oxygen complex;

(b) agitatingly adding to such molten yttrium-nitrogen-oxygen complex an amount of $Si(NH)_2$ to form a substantially uniform suspension of stoichiometric dehydrated yttrium-nitrogen-oxygen complex; and

(c) heating said suspension of silicon imide, silica, and dehydrated yttrium-nitrogen-oxygen complex to a sufficient, second temperature and for sufficient time to chemical react said suspension and form said silicon yttrium oxynitride.

4,692,321

OXIDATION OF AMMONIA OVER A MIXED CATALYST BED OF COBALT AND ALUMINUM OXIDES

Leonard E. James, Shaker Heights, Ohio; William B. Fisher; Lamberto Crescentini, both of Chester, Va., and Joseph M. Browning, Richmond, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 456,127, Jan. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 270,164, Jun. 3, 1981, abandoned. This application Jul. 21, 1986, Ser. No. 887,752

Int. Cl.[4] C01B *21/26*

U.S. Cl. 423—404 2 Claims

1. In a method of oxidizing ammonia by contacting ammonia and air with a catalyst of cobalt oxide, the improvement comprising

using separate particles of activated alumina in conjunction with

the separate particles of cobalt oxide catalyst

and wherein about 10 to about 50 percent by weight alumina is added and

the catalyst particle size is 6 to 14 mesh, the ammonia and air mixture has an ammonia concentration by volume of 7.5 to 12 percent introduced at a space velocity of from between about 15,000 to 100,000 liters of gas per liter of catalyst bed, the inlet gas temperature is from between about 25° C. to 250° C. and upon ignition the bed temperature ranges from 500° C. to 900° C.

4,692,322

PROCESS FOR PRODUCING A PRODUCT GAS CONTAINING CARBON OXIDES AND HYDROGEN FROM METHANOL

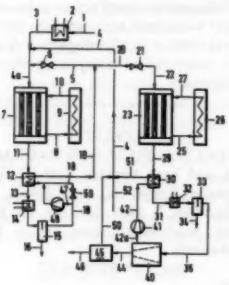
Friedrich-Wilhelm Möller, Friedrichsdorf; Walter Boll, Frankfurt am Main; Friedemann Marschner, Oberursel, and Wolf-Dieter Müller, Bad Homburg, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,997

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1985, 3537152

Int. Cl.[4] C01B *31/18, 1/13*

U.S. Cl. 423—415 A 14 Claims



1. A process for producing a product gas containing carbon oxides and hydrogen which comprises the steps of:

(a) mixing methanol vapor with a gas mixture consisting at least predominantly of carbon dioxide and hydrogen to form a high-methanol mixed feedstock;

(b) feeding said mixed feedstock with an entrance temperature of 300° to 400° C. to a first catalytic reaction zone operated with a zinc-containing catalyst at a temperature up to about 600° and a pressure of 10 to 50 bars to produce an intermediate having a methanol content not exceeding 1% by volume;

(c) withdrawing said intermediate from said first catalytic reaction zone,

(c_1) cooling said intermediate to condense water therein,

(c_2) removing at least part of the condensed water from the intermediate, and

(c_3) reheating the cooled intermediate from which condensed water has been removed to a temperature of about 320° C. to 420° C.,

(d) supplying at least 30% of the reheated intermediate to a second catalytic reaction zone operated with a zinc-containing catalyst at a temperature up to about 600° C. and a pressure of 10 to 50 bars to produce a precursor product at a temperature of about 350° C. to 600° C.;

(e) withdrawing said precursor product from said second catalytic reaction zone,

(e_1) cooling the withdrawn precursor product, and

(e_2) removing an aqueous condensate from the cooled precursor product;

(f) separating the precursor product from which said aqueous condensate has been removed into at least two gas streams by passing the precursor product through a plurality of selectively permeable membranes in a separating zone;

(g) withdrawing a first gas stream containing at least 90% by volume hydrogen and carbon dioxide from said separating zone,

(g_1) mixing additional carbon dioxide with the withdrawn first gas stream, and

(g_2) feeding the first gas stream with which additional carbon dioxide has been mixed to step (a) and said gas mixture thereof; and

(h) withdrawing as a second gas stream from said separating zone a product stream containing at least 30% by volume carbon monoxide.

4,692,323

PROCESS FOR SEPARATION OF MAGNESIUM-BASED, AND POSSIBLY FLUORINE-AND ALUMINUM-BASED IMPURITIES FROM A WET-PRODUCED PHOSPHORIC ACID

Gilbert Bonel, Toulouse; Jean C. Heughebaert, Castanet-Tolosan, both of France; Mohamed Chaabouni, and Hassine Ayedi, both of Sfax, Tunisia, assignors to Centre National de la Recherche Scientifique (C.N.R.S.), Paris, France

PCT No. PCT/FR85/00247, § 371 Date Jun. 12, 1986, § 102(e) Date Jun. 12, 1986, PCT Pub. No. WO86/01792, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 13, 1985, Ser. No. 878,976

Claims priority, application France, Sep. 14, 1984, 84 14734

Int. Cl.[4] C01B *25/16*

U.S. Cl. 423—321 R 13 Claims

1. A process for the separation of impurities of magnesium, aluminum and fluorine from wet-process produced phosphoric acid by precipitating the impurities as a crystalline complex comprising adjusting the atomic ratio of fluorine to magnesium in the acid to at least 4 by the addition of a fluorine compound, adjusting the atomic ratio of aluminum to magnesium in the acid to at least 0.5 by the addition of an aluminum compound, adding an ammonium compound soluble in the phosphoric acid to the phosphoric acid so as to cause a reaction forming an insoluble complex of ammonium, magnesium, fluorine and aluminum, and causing a physical separation of said insoluble complex from said phosphoric acid.

4,692,324
METHOD AND COMPOSITION FOR IN VIVO RADIOLABELING OF RED BLOOD CELLS WITH ^{99m}TC

Michael H. Davis, 2040 S. Broadway Ave., Springfield, Mo. 65807

Filed Oct. 4, 1985, Ser. No. 784,020
Int. Cl.[4] A61K *43/00, 49/02, 49/00;* G01N *33/15*
U.S. Cl. 424—1.1 23 Claims

1. A method of treating a mammalian patient for tinning red blood cells in vivo, said method comprising

orally administering to the patient about 8.9 mg/kg body weight to about 10 mg/kg body weight of a composition consisting essentially of

(1) about 10 mg to about 30 mg stannous chloride, and

(2) about 250 mg to about 1000 mg potassium perchlorate; and

incubating red blood cells in vivo for a time sufficient for Sn^{2+} to be absorbed by the red blood cells.

14. A method of carrying out equilibrium blood pool imaging in a patient, said method comprising

orally administering to the patient about 8.9 mg/kg body weight to about 42 mg/kg body weight of a composition consisting essentially of

(1) about 10 mg to about 30 mg stannous chloride, and

(2) about 250 mg to about 1000 mg potassium perchlorate;

incubating red blood cells in vivo in the presence of Sn^{2+} for a time sufficient for tin to be absorbed by red blood cells in the patient;

contacting the resulting tinned red blood cells with ^{99m}Tc;

incubating the tinned red blood cells with the ^{99m}Tc for a time sufficient to radiolabel the cells; and

imaging a blood pool of the patient with means for detecting and reporting radioactivity emitted by the ^{99m}Tc.

15. A kit for tinning red blood cells of a patient in vivo in preparation for radiolabeling the cells with ^{99m}Tc, wherein the kit contains a drug consisting essentially of

(1) a solid, unit dose of stannous compound consisting essentially of about 10 mg to about 30 mg of stannous chloride sufficient to tin the red blood cells in vivo; and

(2) a solid, unit dose of potassium perchlorate in an amount of about 250 mg to about 1000 mg sufficient to substantially inhibit absorption of ^{99m}Tc by the gut of a patient, while permitting the tinning of red blood cells and radiolabeling of red blood cells with ^{99m}Tc;

wherein the stannous chloride and potassium perchlorate are in a weight ratio of about 1:5 to about 1:100.

4,692,325
RADIOPAQUE MEDIUM

Steven Kritzler, Cronulla, Australia, assignor to Field Group Chemicals Pty. Ltd., New South Wales, Australia

Continuation of PCT AU 84/00101, filed Jun. 5, 1984, published as WO 84/04888 on Dec. 20, 1984. This application Feb. 1, 1985, Ser. No. 697,338
Claims priority, application Australia, Jun. 9, 1983, PF9771
Int. Cl.[4] A61K *37/26*
U.S. Cl. 424—4 2 Claims

1. A system for use in double contrast radiography of patient, said system comprising:

a first part comprising an aqueous medium which contains finely divided barium sulphate,

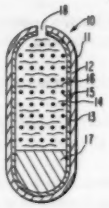
a second part which is a liquid adapted for administration separately from the first part and which is substantially radiolucent,

said first and second parts, after contact, forming a compound or complex at their interface which inhibits migration of the finely divided barium sulphate from the first part to the part.

4,692,326
DISPENSER COMPRISING INNER POSITIONED SOFT OR HARD CAPSULE

James B. Eckenhoff; Felix Theeuwes, both of Los Altos, and Joseph C. Deters, Mountain View, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 591,824, Mar. 21, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,353
Int. Cl.[4] A61K *9/48, 9/52*
U.S. Cl. 424—15 1 Claim



1. A dispenser for dispensing a beneficial drug to a biological environment of use, wherein the dispenser comprises:

(a) a wall comprising in at least a part a semipermeable composition permeble to the passage of fluid and substantially impermeable to the passage of the beneficial drug which wall surrounds;

(b) a capsule, which capsule is a member selected from the group consisting of a hard capsule and a soft capsule;

(c) means in the capsule for forming a dispensable composition in response to the temperature of the biological environment of use, which thermo-responsive means is a member selected from the group consisting of a wax, butter, stearate, partially hydrogenated oil, hydrogenated oil, ester, ether, polyoxyalkylene, glyceride of fatty acid, fatty acid, and copolymer of alkylene oxide;

(d) a dosage amount of a beneficial drug present in the thermo responsive means for forming the dispensable composition;

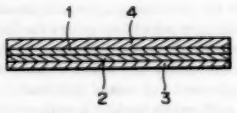
(e) means in the capsule for increasing in volume and for occupying an increasing amount of the capsule for urging the dispensable composition from the dispenser, said means a solid osmotically effective polymeric composition that interacts with fluid and expands; and,

(f) at least one orifice in the dispenser for delivering the dispensable composition comprising the beneficial drug from the dispenser.

4,692,327
LAMINATED FILM FOR PACKAGING

Toru Takahashi, and Taro Yoshida, both of Tokyo, Japan, assignors to Fujimori Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,685
Claims priority, application Japan, Sep. 6, 1984, 59-186843; May 9, 1985, 60-96680
Int. Cl.[4] B27N *5/02*
U.S. Cl. 428—35 21 Claims



1. A laminated film for packaging which comprises an innermost layer and an outer layer laminated thereover, said innermost layer and said outer layer forming a laminated film that is suitable for the production of a container that is capable of

containing cosmetics and contents having flavoring ingredients, wherein said innermost layer is formed with a polyester film obtained from a mixture of (1) a polyester resin with an average molecular weight of from 20,000 to 40,000 as a main resin component and (2) an auxiliary resin component selected from the group consisting of a polyamide and a polyester resin with an average molecular weight of from 5,000 to 20,000, whereby said innermost layer prevents adsorption and penetration of said cosmetics and said contents having flavoring ingredients into said laminated film, wherein the polyester film is obtained from a mixture of from 5 to 30 parts by weight of the auxiliary resin component and 100 parts by weight of the main resin component.

4,692,328

BIOLOGICALLY USEFUL POLYMER PREPARATIONS

Judith P. Kitchell, Newton, Mass., and Stanton R. de Riel, Pembroke Pines, Fla., assignors to Dynatech Corporation, Cambridge, Mass.

Filed Sep. 24, 1985, Ser. No. 780,162
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—78 **6 Claims**

1. A biologically useful polymer preparation prepared by

A. mixing a first solution comprising 20–60% (weight per volume) copolymer comprising vinyl pyrrolidone and allylamine in a ratio of 10 parts by weight vinyl pyrrolidone to 0-1 part by weight allylamine with a second solution comprising glutaraldehyde to give a final concentration of 0.04–3.6% (weight per volume) glutaraldehyde; and

B. forming a film from the mixture of step A.

4,692,329

ERYTHROMYCIN/BENZOYL PEROXIDE ANTIACNE COMPOSITIONS

Robert W. Klein, Blue Bell, Pa., and Mary E. Foxx, Plainsboro, N.J., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 455,283, Jan. 3, 1983, Pat. No. 4,497,794, which is a continuation of Ser. No. 214,124, Dec. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 843,007, Oct. 17, 1977, abandoned, which is a continuation of Ser. No. 637,613, Dec. 4, 1975, abandoned. This application Jul. 3, 1984, Ser. No. 627,351
The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.
Int. Cl.[4] A61K *31/70, 31/78*
U.S. Cl. 424—81 **7 Claims**

1. A therapeutic aqueous gel composition comprising:

about 2.5 to about 15% by weight of micronized benzoyl peroxide having particle size of less than about 150 microns; and

about 0.5 to about 5% of an erythromycin compound selected from the group consisting of erythromycin and its stearate, and glucoheptonate derivatives; and

wherein the amount of said peroxide is about one-half to about thirty times the weight of said erythromycin compound.

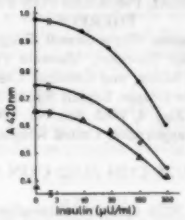
4,692,330

PROCESS FOR ACCELERATING ANTIGEN-ANTIBODY REACTION

Yamamoto Ryohei; Kimura Shigeki, both of Aichi, and Matsuura Akira, Kasugai, all of Japan, assignors to Amano Pharmaceutical Co., Ltd., Japan

Filed Sep. 20, 1985, Ser. No. 778,558
Int. Cl.[4] A61K *39/00, 43/00, 39/395*
U.S. Cl. 424—85 **24 Claims**

1. Process for accelerating an antigen-antibody reaction which comprises adding dextran to the reaction mixture of an immunochemical reaction in vitro of at least one of an antigen and a modified antigen, with at least one of an antibody therefor and a modified antibody therefor, to thereby accelerate the and said modified antibody each independently being modified



by being immobilized on an insoluble carrier or by being labeled with a detectable substance.

4,692,331

GAMMA-GLOBULIN PREPARATION FOR INTRAVENOUS ADMINISTRATION

Yahiro Uemura, Hirakata, Japan, and Satoshi Funakoshi, Los Angeles, Calif., assignors to The Green Cross Corporation, Osaka, Japan

Filed Feb. 24, 1984, Ser. No. 583,268
Claims priority, application Japan, Feb. 25, 1983, 58-31460
Int. Cl.[4] A61K *39/395*
U.S. Cl. 424—85 **4 Claims**

1. An intravenously administrable γ-globulin dry preparation obtained by fractionating human plasma using polyethylene glycol, which preparation is substantially free of any remaining polyethylene glycol, the preparation comprising γ-globulin and from 0.2 to 2.0 parts by weight, based on one part by weight of γ-globulin, of glucose to stabilize the γ-globulin.

4,692,332

IMMUNOTHERAPEUTIC METHODS AND COMPOSITIONS EMPLOYING ANTIGENS CHARACTERISTIC OF MALIGNANT NEOPLASMS

John McMichael, P.O. Box 81, R.D. 3, Cambridge Springs, Pa. 16403

Filed Jan. 18, 1985, Ser. No. 692,822
Int. Cl.[4] A61K *39/00, 45/05, 39/40*
U.S. Cl. 424—88 **4 Claims**

1. A method for tumor reduction in a disease victim comprising the steps of:

administering to the disease victim a member selected from the group consisting of human chorionic gonadotropin and equine chorionic gonadotropin and pharmaceutically effective fragments and pharmaceutically effective derivatives thereof, in a pharmacuetically effective amount which is less than the lowest amount necessary to provoke a humoral immune response, as exemplified by the presence of a positive wheal upon subcutaneous administration; and

co-administering a lysate of Staphylococcus aureus in an amount which is less than the lowest amount necessary to provoke a humoral immune response in combination with the member, as exemplified by the presence of a positive wheal upon subcutaneous administration.

4,692,333

ANTIMICROBIAL AND ANTITUMOR ANTIBIOTIC M 9026 AND ITS PURE INDIVIDUAL FACTORS 1, 2, AND 3 AND MICROBIAL PROCESS FOR PRODUCTION THEREOF

Giorgio Pirali, Saronno; Maria Grandi, Reggio Emilia; Hermes Pagani, Sesto San Giovanni; Manuela Paternoster, Meda; Giorgio Tamoni, Milan, and Giovanni Cassani, Pavia, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Aug. 4, 1983, Ser. No. 520,088

Claims priority, application United Kingdom, Aug. 26, 1982, 8224512

Int. Cl.[4] A61K *35/74*; C12D *13/02*; C12N *1/20*; C12R *1/29*

U.S. Cl. 424—122 18 Claims

1. Antibiotic M 9026 complex obtainable by culturing the strain Micromonospora sp. NRRL 15,118, or M 9026 complex producing mutants thereof, under submerged aerobic conditions, in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts until substantial M 9026 complex activity is imparted to the culture medium, filtering the fermented medium, extracting the antibiotic M 9026 complex from the filtrate, causing the antibiotic M 9026 complex to precipitate from the extract, and collecting the solid precipitate, wherein the antibiotic M 9026 complex has the following infrared absorption maxima (cm^{-1}): 3260 (broad), 3060, 2730, 1735, 1720 (shoulder), 1650, 1630, 1545, 1515, 1495, 1300, 1260, 1210, 1170, 1090, 1030, 980, 940, 830, 760, 720, 700; and has an ultraviolet terminal absorption in methanol at 215 nm.

4,692,334

METHOD FOR TREATING HYPERCHOLESTEROLEMIA WITH CRYPTOCIDIN

Harry W. Gordon, Bronx, N.Y., assignor to Schmid Laboratories

Continuation of Ser. No. 271,566, Jun. 8, 1981, Pat. No. 4,482,540, which is a continuation of Ser. No. 029,198, Apr. 12, 1979, Pat. No. 4,292,310, which is a division of Ser. No. 794,920, May 9, 1977, Pat. No. 4,163,050, which is a division of 521,289, Nov. 6, 1974, Pat. No. 4,039,659, which is a division of Ser. No. 177,512, Sep. 2, 1971, Pat. No. 3,855,409, and a continuation of Ser. No. 221,062, Jan. 26, 1972, Pat. No. 3,966,910, and a continuation of Ser. No. 24,797, Apr. 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, Mar. 31, 1967, Pat. No. 3,627,879. This application Aug. 29, 1984, Ser. No. 645,484

Int. Cl.[4] A61K *35/74*

U.S. Cl. 424—122 3 Claims

1. A method for treating hypercholesterolemia in a large mammal afflicted with hypercholesterolemia which comprises orally administering an effective dose for treating hypercholesterolemia of cryptocidin to said mammal.

4,692,335

CALCIUM HYPOCHLORITE TABLET

Donald P. Iwanski, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 3, 1985, Ser. No. 771,868

Int. Cl.[4] A01N *25/00*

U.S. Cl. 424—149 12 Claims

1. A solid article comprising a compressed mixture of granular calcium hypochlorite and from about 0.5 to about 5.0 weight percent of a solid wax binder selected from the group consisting of microcrystalline hydrocarbon wax and alkali metal salts of oxidized microcrystalline hydrocarbon wax.

4,692,336

SELF CONTROLLED RELEASE DEVICE FOR ADMINISTERING BENEFICIAL AGENT TO RECIPIENT

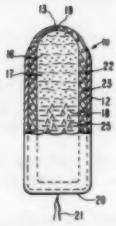
James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 590,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Aug. 7, 1985, Ser. No. 763,365

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] A61K *9/22*; A61M *31/00*

U.S. Cl. 424—468 23 Claims



1. A delivery device for delivering a beneficial agent formulation to an environment of use, the delivery device comprising;

(a) wall means that surrounds and defines an internal compartment;

(b) means in the compartment for expanding and occupying an increasing area of the compartment;

(c) means in the compartment for absorbing thermal energy from the environment and for carrying a beneficial agent;

(d) a dosage unit amount of a beneficial agent present in the means for absorbing thermal energy from the environment; and,

(e) means in the wall for delivering the beneficial agent from the delivery device to the environment over time.

4,692,337

SUSTAINED RELEASE PHARMACEUTICAL TABLET OF THEOPHYLLINE AND PRODUCTION PROCESS THEREOF

Tadashi Ukigaya, and Keizaburo Ogawa, both of Kawagoe, Japan, assignors to Nikken Chemicals Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,738

Claims priority, application Japan, Apr. 9, 1983, 58-61524

Int. Cl.[4] A61K *9/26*, *31/52*

U.S. Cl. 424—469 2 Claims

1. A sustained release tablet consisting essentially of theophylline and ethyl cellulose produced by uniformly mixing together said theophylline and ethyl cellulose in an amount of 5 to 200 parts by weight of ethyl cellulose based on 100 parts by weight of the theophylline, and thereafter directly compressing the mixture into tablets having a hardness of from 0.5 to 16.0 kg.

4,692,338

MILK SUBSTITUTE

Sheila M. Irvine, 8 Starling Way, Brickhill, Bedfordshire; Alistair Penman, 8 Bewcastle Close, Bedford, and Geoffrey B. Wood, 41 Salisbury Road, Harpenden, Hertfordshire, all of England

Continuation of Ser. No. 469,473, Mar. 2, 1983, abandoned, which is a continuation of Ser. No. 301,198, Sep. 11, 1981, abandoned, which is a continuation of Ser. No. 194,294, Apr. 21, 1980, abandoned. This application Mar. 28, 1985, Ser. No. 716,609

Claims priority, application United Kingdom, Aug. 25, 1978, 34723/78

Int. Cl.[4] A23K *1/18*

U.S. Cl. 426—2 24 Claims

1. A milk substitute in dry powder form, reconstitutable with water to provide a milk-like liquid suitable for feeding to mam-

malian young, the unreconstituted powder consisting essentially of, by weight, from 50 to 80 percent skim milk powder, at least 0.5% by weight of an acid-responsive food grade preservative selected from the group consisting of water-soluable propionates, acetates, formates, and mixtures thereof, and an edible acidifying system selected from the group consisting of malic acid, citric acid, tartaric acid, formic acid, acetic acid and mixtures thereof, in an amount sufficient to generate a pH value in the milk substitute immediately after reconstitution in the range of 6.0 to 5.2.

4,692,339

PROCESS FOR ADDITION AND STABILIZATION OF VITAMIN C IN A HARD CANDY-LIKE COMESTIBLE

Charles G. Stetson, P.O. Box 76, Yankton, S. Dak. 57078, and Catherine C. Stetson, 2794 E. 8th, #202, Sioux Falls, S. Dak. 57103

Continuation-in-part of Ser. No. 430,598, Sep. 30, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 670,006

Int. Cl.⁴ A23L *1/302;* **A23G** *3/00*

U.S. Cl. 426—72 **13 Claims**

1. A method for making a cooked, hard Vitamin C-containing comestible comprising:

dissolving a candy-forming compound, selected from the group consisting of sugars, polyhydric alcohols and mixtures thereof, in water;

heating the resulting solution to a temperature whereat a hard candy will be formed upon cooling to thereby form a molten candy;

removing the molten candy from the heat source and, while said candy is hot and fluid, dispersing within the molten candy solid Vitamin C-containing compound selected from the group consisting of ascorbic acid, sodium ascorbate and mixture thereof to form a uniform admixture thereof;

immediately thereafter casting said admixture into molds, and

rapidly cooling the cast admixture within the molds to a solid, crystalline state wherein the elasped time between introduction of the Vitamin C-containing compound into the molten candy and its cooling to a solid crystalline state in molds is less than one minute.

4,692,340

PROCEDURE FOR THE PRODUCTION OF A GRANULATED INFANT MILK FOOD PRODUCT

Friedrich-Karl Grütte, Caputh; Heinrich Petzold, Bergholz-Rehbrücke; Ulrich Walter, Potsdam-Bornstedt; Gunhild Bogs; Joachim Domeratzky, both of Halle; Helmut Gärtner, Kleinmachnow; Jürgen Schulze, Bergholz-Rehbrücke; Hans-Joachim Zunft, Kleinmachnow; Otto Pulz, Potsdam-Babelsberg; Christa Luft, Potsdam; Waiheide Müller, Potsdam-Wildpark; Petra Wölk; Hannelore Dahlke, both of Potsdam, and Margret Volkmer, Potsdam-Babelsberg, all of German Democratic Rep., assignors to Institut für Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee, Bergholz-Rehbrucke, German Democratic Rep.

Continuation of Ser. No. 496,707, May 20, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 785,023

Claims priority, application German Democratic Rep., Dec. 2, 1982, 245460

Int. Cl.⁴ A23C *11/00, 9/00, 21/06*

U.S. Cl. 426—72 **10 Claims**

1. A method for the production of a granulate for infant food, for reconstitution with water to form a liquid analogous to mother's milk, said granulate having a moisture content of 0.5 to 5%, comprising feeding lactose or lactose and whey protein powder into a fluidized bed granulator and spraying a caseinate-fat emulsion containing vitamins and minerals onto the lactose or lactose and whey protein powder in the granulator, the caseinate-fat having a fat particle maximum size of 10μ and a moisture content of 20 to 70%, and the caseinate being of a casein acid-precipitated from cow's milk which is lower in calcium and phosphate content than bound calcium and phosphate in casein in cow's milk, the minerals containing at least one water soluble or water insoluble calcium salt and a water soluble source of anions and being added in such quantities that the total content of calcium is from 240 mg to 500 mg per 100 g granulate and the total content of phosphate is from 360 to 1200 mg per 100 g granulate, wherein the concentration of calcium ions is below 10^{-2} Mol/l and the phosphate content does not exceed 60 mg/ml when the granulate is reconstituted with water and the lactose is fed into the granulator in such a quantity that the lactose content of the granulate is at least 40g/100 g granulate and the granulate has a final moisture content of 0.5 to 5% and the total calcium and phosphate contents are each based on granulate having a moisture content of 0.5 to 5%.

4,692,341

METHOD FOR PRODUCING A FOOD PRODUCT SIMULATING SHELLFISH

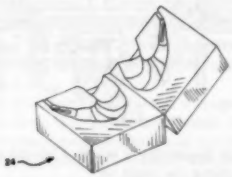
Hiroji Ikeuchi, and Kiyoaki Ikeuchi, both of Akashi, Japan, assignors to Kabushiki Kaisha Ikeuchi Tekkosho, Akashi, Japan

Filed Jan. 13, 1986, Ser. No. 818,618

Claims priority, application Japan, Sep. 24, 1985, 60-211805; Dec. 2, 1985, 60-271789

Int. Cl.⁴ A23L *1/27, 1/325;* **A23P** *1/00*

U.S. Cl. 426—250 **1 Claim**



1. A process for producing a food product simulating shellfish using a split mold having a mold cavity therein which generally conforms to the shape of a shellfish to be simulated, said mold cavity having a cavity wall including flat portions and crosswise projecting striations, said striations having upstream sides and behind sides, comprising the steps of closing said mold, spraying said cavity wall with an aqueous food coloring and forming pools of the food coloring on said flat segments on said upstream sides and leaving said behind sides substantially clear of said coloring, filling the cavity with a meat paste under pressure, heating the mold to a sufficient temperature to solidify and color the meat paste, and removing the meat paste from the cavity by opening the split mold.

4,692,342

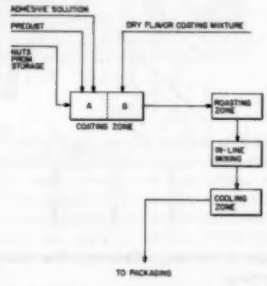
PROCESS FOR HONEY-ROASTING NUTS

Peter M. Gannis, Stamford; Howard Wilkins, Brookfield, both of Conn., and Oris E. Holloway, Jr., Sparta, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Nov. 14, 1985, Ser. No. 797,914

Int. Cl.⁴ A23L *1/36*

U.S. Cl. 426—293 **12 Claims**



1. A process for preparing honey-roasted nuts which comprises the steps of:

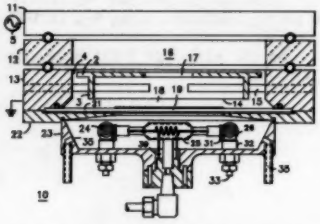
admixing raw nuts with a dry adhesive for a time effective to achieve a uniform coating of the dry adhesive on the nuts;
applying an adhesive solution comprising a mixture of honey, water, and dissolved adhesive to the nuts and tumbling for a period of time effective to provide a uniform, tacky coating of adhesive on the nuts;
admixing with the resulting adhesive coated nuts, a dry flavor coating mixture comprising honey, sugar and salt; and
roasting the resulting coated nuts.

4,692,343

PLASMA ENHANCED CVD

J. B. Price, Scottsdale, and Schyi-Yi Wu, Mesa, both of Ariz., assignors to Spectrum CVD, Inc., Phoenix, Ariz.

Continuation of Ser. No. 762,354, Aug. 5, 1985, abandoned. This application May 12, 1986, Ser. No. 861,793
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **6 Claims**



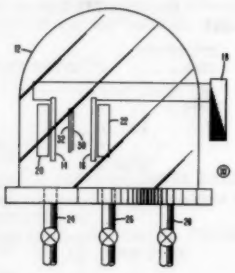
1. A process for depositing a layer of tungsten silicide on a workpiece comprising the steps of:
placing said workpiece in a plasma reaction chamber;
providing a mixture of a tungsten bearing gas and a silicon bearing gas within said chamber;
heating said workpiece to a predetermined temperature;
causing a plasma discharge within said chamber for a first period of time during which deposition of said layer begins; and
maintaining said workpiece at said predetermined temperature for a second, longer period of time during which said layer continues to be deposited.

4,692,344

METHOD OF FORMING A DIELECTRIC FILM AND SEMICONDUCTOR DEVICE INCLUDING SAID FILM

Grzegorz Kaganowicz, Belle Mead; Alfred C. Ipri, and Richard S. Crandall, both of Princeton, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1986, Ser. No. 834,384
Int. Cl.[4] H01L *21/318*
U.S. Cl. 427—39 **6 Claims**



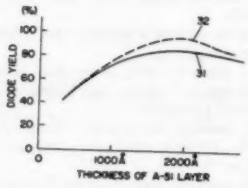
1. A method of forming a dielectric film on a semiconductor body comprising
subjecting a first major surface of said semiconductor body to a glow discharge in the presence of silane and a nitrogen-containing material; and
depositing a hydrogen-containing, silicon nitride film substantially free of silicon-to-hydrogen bonds, over said first major surface, said silicon nitride film having a silicon to nitrogen ratio of between about 0.65:1 and 0.80:1.

4,692,345

METHOD FOR GETTERING HEAVY METAL FROM A SILICON PLATE

Masaharu Nishiura, Yokosuka, and Hiromu Haruki, Yokohama, both of Japan, assignors to Fuji Electric Corporate Research and Devel., Ltd., Japan

Continuation of Ser. No. 649,524, Sep. 11, 1984, abandoned. This application May 20, 1986, Ser. No. 868,153
Claims priority, application Japan, Dec. 1, 1983, 58-227663
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **7 Claims**



1. A method for gettering a heavy metal from a single crystal silicon plate comprising
(a) depositing a layer of amorphous silicon of between 1000 Å and 2500 Å in thickness on one surface of a single crystal silicon plate; and
(b) heating said layer of amorphous silicon to a temperature exceeding the crystallizing temperature of amorphous silicon, thereby converting said layer of amorphous silicon into a layer of polycrystalline silicon and gettering the heavy metal from the single crystal plate by way of the layer of polycrystalline silicon.

4,692,346

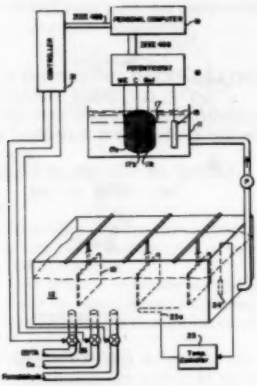
METHOD AND APPARATUS FOR CONTROLLING THE SURFACE CHEMISTRY ON OBJECTS PLATED IN AN ELECTROLESS PLATING BATH

Donald G. McBride, Binghamton, and Robert G. Rickert, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1986, Ser. No. 854,262
Int. Cl.[4] C23C *3/02*
U.S. Cl. 427—8 **10 Claims**

1. A method for controlling the chemical state of an electroless plating bath comprising:
immersing a plating working electrode, counter electrode and reference electrode in said plating bath;
applying a varying electrical potential between said plating working electrode and counter electrode;
measuring each current peak produced in response to said varying electrical potential, whereby the transition state of a chemical component being plated by said bath for a present pH level of said bath is identified, and storing the open circuit voltage measured between said reference electrode and said plating working electrode for each measured current peak;
monitoring the open circuit potential between said working electrode and said reference electrode during plating of an object, whereby the chemical phase of said chemical component being plated is continuously monitored; and
changing the concentration of said chemical constituent of

said bath to maintain a predetermined voltage differential between the open circuit potential and a setpoint voltage



level whereby the chemical state for said chemical component remains the same.

4,692,347

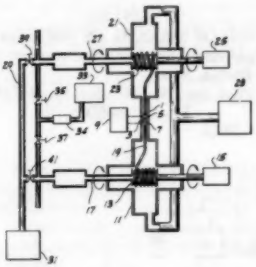
METHOD OF INTERIORLY COATING TUBING

Hirotsuga K. Yasuda, Newburg, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 511,461, Jul. 7, 1983, abandoned. This application Jan. 9, 1985, Ser. No. 689,934

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—40 **6 Claims**



1. A method for providing a thin, substantially uniform polymeric coating on the inside surface of tubing comprising:

passing flexible tubing constituted of dielectric plastic material through a glow discharge zone, said glow discharge being procuded by reactance coupling utilizing power provided by a radio requency power source; and

simultaneously with the movement of said tubing through said glow discharge zone, passing an organic monomer that is subject to glow discharge polymerization through said glow discharge zone in the interior of said tubing while maintaining an absolute pressure of between about 300 and about 900 mtorr in said interior within said zone, thereby effecting glow discharge polymerization of said monomer to form a thin polymeric coating on the inside surface of said tubing.

4,692,348

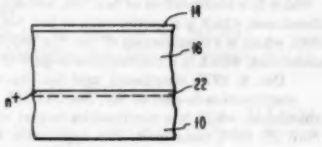
LOW TEMPERATURE SHALLOW DOPING TECHNIQUE

Gary W. Rubloff, Katonah, and Marc F. Wittmer, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 622,949, Jun. 21, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,893

Int. Cl.[4] B05D *5/12*

U.S. Cl. 437—82 **30 Claims**



1. A method for producing a very shallow doped region in a substrate, comprising the steps of:

depositing at least two overlayers on the top surface of said substrate, one of which contains metal atoms, to produce a multilayered structure, said overlayers being capable of forming a metal compound when treated at a temperature less than 700° C., and wherein at least one of said overlayers contains an element to be introduced as an n-type dopant into said substrate to produce said shallow doped region therein,

treating said multilayer structure at a temperature less than 700° C. to form said metal compound, the formation of said metal compound releasing said element and producing a sharp compound formation interface which moves toward said substrate and pushes said n-type dopant by the snowplow effect toward said substrate and pushes said dopant by the snowplow effect toward said silicon substrate, and

continuing said treating step for a time sufficient to move said interface to said substrate to push said n-type dopant into the body of said substrate a distance not exceeding 300 angstroms from the top surface of said substrate.

4,692,349

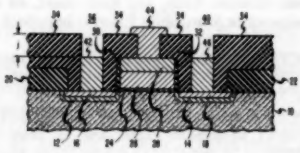
SELECTIVE ELECTROLESS PLATING OF VIAS IN VLSI DEVICES

George E. Georgiou, Gillette, and Gary N. Poli, High Bridge, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1986, Ser. No. 835,355

Int. Cl.[4] C23C *18/34*

U.S. Cl. 437—230 **5 Claims**



1. A selective electroless plating method of forming microminiature conductive plugs in high-aspect-ratio vias defined in a dielectric layer disposed on one main planar surface of a wafer in which integrated-circuit devices are to be fabricated, at least one of said vias having at the bottom thereof an active layer comprising a material selected from the group consisting of tantalum silicide and titanium silicide, said method comprising the step of

immersing said wafer in a plating bath comprising a metallic

source that provides ions selected from the group consisting of cobalt and nickel.

4,692,350

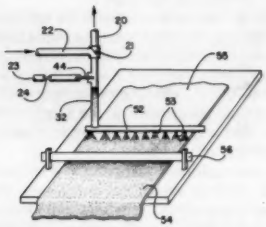
ASPHALT COATING METHOD

Aubrey R. Clarke, Brighton South; Colin L. Martin, East Kew, and Robert H. Bowering, Mount Waverley, all of Australia, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 681,062, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 444,403, Nov. 22, 1982, abandoned, which is a continuation of Ser. No. 153,428, May 27, 1980, which is a continuation of Ser. No. 965,363, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 638,243, Dec. 8, 1975, abandoned, said Ser. No. 638,243, is a continuation-in-part of Ser. No. 313,312, Dec. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 92,771, Nov. 25, 1970, abandoned. This application Apr. 1, 1986, Ser. No. 846,840

Int. Cl.[4] B05D *5/10*; E01C *5/12*

U.S. Cl. 427—138 **24 Claims**



1. A method of forming a coating of an asphaltic base material on a substrate which comprises:

(a) combining a heated, liquid asphaltic base material with a liquid foaming agent in an adiabatic dispersion zone to form a dispersion of the foaming agent and base material, wherein the heat content of the dispersion so formed is sufficient to cause vaporization of the foaming agent at atmospheric pressure,

(b) discharging the dispersion from the adiabatic dispersion zone to atmospheric pressure thereby forming a foam of the base material and

(c) applying the foam so formed to the substrate without substantial heating of the substrate.

4,692,351

METHOD AND APPARATUS FOR DRAWING A THICK FILM CIRCUIT

Yukio Maeda; Shinichi Kudo, and Keiji Saeki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

PCT No. PCT/JP85/00199, § 371 Date Dec. 16, 1985, § 102(e) Date Dec. 16, 1985, PCT Pub. No. WO85/05005, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 15, 1985, Ser. No. 817,833

Claims priority, application Japan, Apr. 16, 1984, 59-76008

Int. Cl.[4] B05D *1/26*; B05C *9/02*; G01D *15/16*; F04B *43/04*

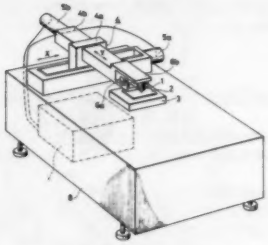
U.S. Cl. 427—196 **10 Claims**

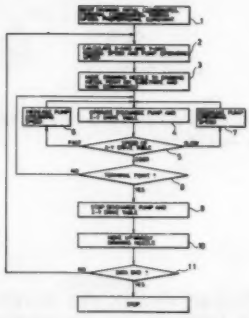
1. A method for drawing a thick film circuit on a substrate by discharging a paste from a discharge hole provided at one end of a drawing nozzle, said drawing nozzle being located close to said substrate and being moved parallel relative to a surface of said substrate, said method comprising the steps of:

(a) determining in advance a desired relative moving speed of said drawing nozzle with respect to said substrate and a proportional constant to be used for obtaining a discharge rate of the paste corresponding to the desired relative moving speed of said drawing nozzle;

(b) detecting an actual relative moving speed of said drawing nozzle with respect to said substrate;

(c) comparing the detected actual relative moving speed





with the desired relative moving speed of said drawing nozzle; and

(d) correcting said discharge rate in accordance with the results of said comparison.

4,692,352

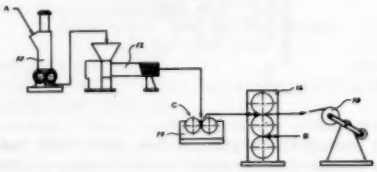
METHOD OF MAKING AN ADHESIVE TAPE

Elwyn G. Huddleston, Franklin, Ky., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 29, 1986, Ser. No. 857,692

Int. Cl.[4] B05D *5/10*

U.S. Cl. 427—208.4 **26 Claims**



1. In a method for making an adhesive tape comprising a backing sheet carrying a rubber-based adhesive wherein the rubber components of said adhesive are admixed at an elevated temperature at a first mixing station to form a premix for said adhesive; a material is incorporated in said premix at a second mixing station at an elevated temperature to form said adhesive; and said adhesive is thereafter coated onto said backing sheet at an elevated temperature, said material being reactive with at least one component of said premix at said elevated temperature;

the improvement comprising the steps of employing a cavity transfer mixer as said second mixing station; thereafter

rapidly coating said adhesive onto said backing sheet to form said tape before any more than at most only minimal amounts of said material can react with said component; and rapidly cooling said tape to a temperature at which said material cannot react with said component.

4,692,353

METHOD OF INHIBITING DEGENERATION OF DIRECT REDUCED IRON

Jaleel K. Ahmed, Babylon, Iraq, assignor to Ministry of Industry & Minerals Specialized Institute for Engineering Industries, Baghdad, Iraq

Filed Jan. 3, 1984, Ser. No. 567,782
Int. Cl.[4] B05D 7/00
U.S. Cl. 427—216 14 Claims

1. A method of processing iron ore, the method comprising:
directly reducing iron ore to form porous or spongy direct reduced iron (DRI) material;
immersing said DRI material in molten wax to impregnate said material while the material is still hot from the direct reduction process and prior to reoxidation or other deterioration thereof; and
removing the DRI material from the molten wax, allowing wax to drain from the exterior surface of the DRI material, and permitting the wax within the pores of the DRI material to cool and harden, whereby the DRI material is protected against oxidation or other deterioration under adverse conditions.

4,692,354

METHOD FOR PREPARING CERAMIC MEMBRANE FOR SEPARATION OF CONDENSED COMPONENT

Masashi Asaeda, 19-15,Kogo-naka 2-chome, Nishi-ku, Hiroshima City, Hiroshima Pref.; Kazutaka Mori, and Hiroshi Makihara, both of Hiroshima, all of Japan, assignors to Masashi Asaeda and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 895,862
Int. Cl.[4] B05D 5/00
U.S. Cl. 427—244 6 Claims

1. A method for preparing a ceramic membrane for the separation of a condensed component which is characterized by comprising the steps of impregnating pores of a ceramic porous material with an alumina sol produced by hydrolyzing an aluminum alcoholate or an aluminum chelate; immersing said ceramic porous material into an aqueous sodium silicate solution; and subjecting said ceramic porous material to a water vapor treatment in a high temperature water vapor.

4,692,355

METHOD FOR IMPARTING FLAME RESISTANCE TO WOOD USING DIMETHYL (OXIRANYLMETHYL) PHOSPHONATE AND A CATALYST

H. Nelson Beck, Walnut Creek, and Dalton C. MacWilliams, Alamo, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1986, Ser. No. 866,539
Int. Cl.[4] D06M 1/02; C09D 5/16, 5/18; B05D 3/12
U.S. Cl. 427—297 17 Claims

3. A method for imparting flame resistance to a wood having a fabricated shape which comprises:
(a) impregnating exposed surfaces of the wood having the fabricated shape with a reactive amount of dimethyl(oxiranylmethyl)phosphonate and with a catalytic amount of a catalyst which promotes reaction of an epoxide group in a confined chamber at a differential pressure; and
(b) reacting the dimethyl(oxiranylmethyl)phosphonate with the wood at an elevated temperature to produce a flame resistant treated wood having the fabricated shape with the reacted phosphonate chemically bound in the treated wood.

6. The method of claim 3 wherein the differential pressure for impregnating the wood is an elevated pressure between about 5 and 1000 psig or a reduced pressure between about −3 and −14.5 psig.

4,692,356

PROCESS FOR METALLIZING A SOLID BODY

Robert Ostwald, Ulm, and Gabriele Voit, Biberach, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP84/00223, § 371 Date Feb. 11, 1985, § 102(e) Date Feb. 11, 1985, PCT Pub. No. WO85/00623, PCT Pub. Date Feb. 14, 1985
PCT Filed Jul. 18, 1984, Ser. No. 703,679
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326253
Int. Cl.[4] B05D 3/10
U.S. Cl. 427—304 11 Claims

1. Process for metallizing a solid body having a cleaned non-metallic surface comprising:
(a) applying a first layer comprising at least one material selected from the group consisting of at least one alloy of indium-tin and at least one oxide of an alloy of indium-tin to the cleaned surface of a nonmetallic solid body, said at least one alloy of indium-tin comprising the first layer being selected such that a subsequently applied catalyst metal compound is reduced to the catalyst metal by it;
(b) depositing at least one catalyst metal compound onto the first layer;
(c) allowing the catalyst metal compound to be reduced by the first layer to a catalyst metal, thereby forming a catalytic germination layer; and
(c) depositing a metal by a process selected from the group consisting of a currentless chemical process and the process of electroplating onto the catalytic germination layer.

4,692,357

PRIMER COMPOSITION FOR OLEFIN RESIN

Junji Mayumi, and Riichiro Maruta, both of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 831,506, Feb. 21, 1986, abandoned. This application Sep. 18, 1986, Ser. No. 908,956
Claims priority, application Japan, Feb. 21, 1985, 60-33199
Int. Cl.[4] B05D 3/02, 1/36
U.S. Cl. 427—393.5 11 Claims

1. A method for coating a polyolefin substrate, consisting of:
(I) applying to said substrate an acidic-group containing resin prepared by polymerizing an α,β-unsaturated carboxylic acid or its anhydride onto a styrene-butadiene-styrene block copolymer or its hydrogenated product wherein said resin is dissolved in an organic solvent at a resin concentration of 5–50 weight percent, and
(II) obtaining a coated polyolefin substrate.

4,692,358

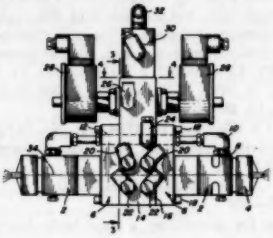
APPARATUS AND METHOD FOR APPLYING MATERIAL TO ARTICLES

Peter Marsden, Harrow, and Paul R. Bradwell, London, both of United Kingdom, assignors to Haden Drysys International Limited, London, United Kingdom

PCT No. PCT/GB85/00111, § 371 Date Nov. 21, 1985, § 102(e) Date Nov. 21, 1985, PCT Pub. No. WO85/04350, PCT Pub. Date Oct. 10, 1985
PCT Filed Mar. 22, 1985, Ser. No. 803,408
Claims priority, application United Kingdom, Mar. 23, 1984, 8407650
Int. Cl.[4] B05B 7/12; B05D 1/02
U.S. Cl. 427—421 11 Claims

1. A method of applying material to a plurality of surface areas using an arrangement of plurality of appplicator nozzles mounted in fixed relation to a common manifold, wherein said nozzle have fluid outlets, all of which face in different directions, the method comprising the steps of orienting said mani-

fold such that a first one of said nozzle outlets is facing in a first direction toward a first surface area, applying material through said manifold and said nozzle onto said first surface area, terminating application of the material through said first nozzle, and



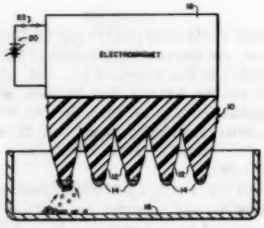
then moving the manifold as necessary to orient a second one of said nozzles to face a further surface area in a direction substantially angularly displaced from the first direction, and applying material through said manifold and said second nozzle onto said further surface area.

4,692,359

MAGNETIC APPLICATION OF LIGHT-ABSORBING PARTICLES TO A LENTICULAR SCREEN

Brian J. Fitzpatrick, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,664
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—45.1 **10 Claims**



1. A method for selectively applying light-absorbing particles to a light-transmissive screen having a surface contoured to include a a multiplicity of raised lenticules having respective peaks and sidewalls, said sidewalls defining grooves between the lenticules, said method comprising the steps of:

(a) disposing near a supply of the light-absorbing particles a carrier sheet comprising a multiplicity of projections having tips including magnetically-permeable material, said tips being shaped and spaced to positionally correspond with the grooves in the screen, said particles consisting essentially of a magnetically-permeable material and having heat-fusible outer surfaces;

(b) applying a magnetic field to the tips to effect attraction thereto of a substantial quantity of the particles;

(c) continuing to apply the magnetic field while positioning the sheet and the screen such that the tips are proximately disposed with respect to the grooves;

(d) reducing the strength of the magnetic field applied to the tips to a magnitude below that needed to maintain attraction of the particles to the tips, thereby effecting release of a substantial quantity of the particles from the tips and into the respective grooves to mask predefined portions of the sidewalls; and

(e) transfusing the screen and the particles in the grooves with microwave radiation of sufficient energy to fuse the particles to each other and to the screen, but of insufficient energy to optically distort the screen material.

4,692,360

METAL INTERLAYERS IN FILMS BY COUNTER-CURRENT DIFFUSION

Lewis E. Manring, and Stephen Mazur, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1986, Ser. No. 820,234
Int. Cl.[4] B05D *1/18*
U.S. Cl. 427—443.1 **27 Claims**

1. Metal interlayer deposition (MID) process by means of which metal is deposited in its zero-valent state within a film having first and second surfaces, the process comprising supplying a solution of ions of the metal to at least part on the first surface and a solution of a reducing agent to at least part of the second surface, the metal ions being in a positive oxidation state and in a coordination state such that they are mobile within the film and are transported in solution through the film in a general direction towards the second surface and the reducing agent being in a negative oxidation state relative to the metal cation and in a coordination state such that it is mobile within the film and is transported in solution through the film in a general direction towards the first surface, the metal ions and reducing agent contacting in a reaction region wherein the metal ions are reduced by the reducing agent to produce a metal interlayer, within the film, having a thickness (l_{int}) which is less than the thickness (L) of the film.

4,692,361

FILM LAMINATE WITH GAS BARRIER FOR STERILE FLEXIBLE CONTAINERS

William D. Johnston, Buffalo Grove; Leonard Czuba, Lombard; R. D. Webster, Barrington, all of Ill.; Yasuhiko Hori, Kawasaki, Japan; Masanori Nagata, Tokyo, Japan, and Shigeki Imano, Kawasaki, Japan, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 28, 1984, Ser. No. 655,493
Int. Cl.[4] B65D *85/72*; B32B *27/08*
U.S. Cl. 428—35 **34 Claims**

1. A laminate film structure having sufficient flexibility, strength, heat sealability, and slip properties for producing on a packaging machine flexible containers having fitments attached thereto and capable of containing a liquid to be maintained under sterile conditions comprising:

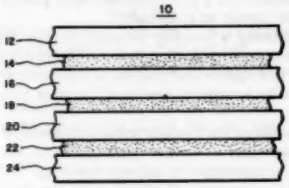
an inner layer constructed from polyethylene, the inner layer having a thickness of approximately 40 to 100 microns;

a gas barrier layer having a thickness of approximately 25 to 50 microns;

a core layer constructed from biaxially oriented polyamide,

the core layer having a thickness of approximately 10 to 40 microns;

an outer layer constructed from polyethylene and having a thickness of approximately 40 to 100 microns, the outer



layer including a slip agent and having a coefficient of friction of approximately 0.2 to about 0.4; and

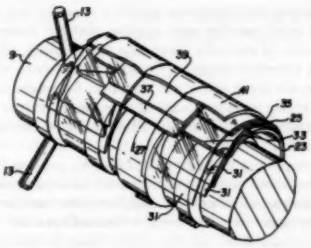
three layers of an aliphatic polyurethane bonding the layers together.

4,692,362

FABRIC REINFORCED TUBULAR RUBBER BLADDERS AND METHOD OF MAKING SAME

James L. Johnson, Johnson City, Tenn., assignor to McCreary Industrial Products Co., Piney Flats, Tenn.

Filed Mar. 25, 1986, Ser. No. 843,583
Int. Cl.[4] B65D *35/02;* B60T *11/10;* B32B *7/14*
U.S. Cl. 428—35 25 Claims



1. A reinforced rubber bladder comprising:

a flattened tubular open-ended multi-layer body member formed from a plurality of rubber body plies, at least some of which are fabric reinforced, having two flat sides and two rounded side edges; and

a fabric reinforced rubber end patch folded substantially in half over the full width of each open end of the flattened tubular body member between body plies with the halves of each patch pinched together at, and trimmed off along, the rounded side edges of the tubular body member without overlapping.

4,692,363

THERMAL INSULATION

Harald Reiss, Leimen, and Botho Ziegenbein, Nickarsteinach, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Continuation of Ser. No. 742,631, Jun. 6, 1985, abandoned, which is a continuation of Ser. No. 536,178, Sep. 27, 1983, abandoned. This application Jul. 22, 1986, Ser. No. 889,581
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235708
Int. Cl.[4] A47J *41/02;* B65D *81/38;* F16L *59/05, 59/06, 59/08*
U.S. Cl. 428—36 4 Claims

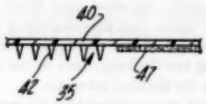
1. Thermal insulation with a gas-tight and at least partially evacuated space, filled with insulating sheets stacked immediately adjacent one another with no metal foil interposed between respective sheets, each of the insulating sheets has a thickness of about 0.5 mm built of interlaced borosilicate glass fibers and with at least 5 through 60% by weight of substances in form of powder or fibers for absorbing and scattering thermal radiation, at least one of said absorbing substances in fiber or powder form has primary particle diameters smaller than one micron and the indices of refraction of the particles of said scattering substances correspond to optimum values determined from a scatter calculation, taking spectral ranges of the thermal insulation into consideration.

4,692,364

RETAINER FOR AUTOMOTIVE FLOOR MAT

Mark Altus, Huntington Woods, Mich., assignor to The 2500 Corporation, Birmingham, Mich.

Filed Nov. 12, 1985, Ser. No. 797,610
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.[4] B32B *3/06;* B60J *9/00*
U.S. Cl. 428—85 48 Claims



1. An improved retainer for an automotive floor mat used on automotive carpets having heel pads, said retainer including:

(a) a planar surface;

(b) a lower bristled surface having bristles of uniform height depending downwardly from said planar surface and covering the entire area thereof except where said lower bristled surface is to contact said heel pad of said automotive carpet, and

(c) a non-slip surface being provided where said bristles have been removed,

(d) mounting means for attaching said retainer to said floor mat.

4,692,365

USE OF AIR-JET TEXTURED YARNS IN THE MANUFACTURING OF ABRASIVES ON SUBSTRATES

Eberhard Kratzsch, Wuppertal; Wolfgang Cygan, Erkrath, and Nandor Kiss, Wuppertal, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, New York, N.Y.

Filed Oct. 30, 1984, Ser. No. 666,522
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339911
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—87 14 Claims

1. A coated abrasive comprising a substrate having an abrasive agent thereon; wherein said substrate has been formed from a polyester filament yarn which has been air-jet textured and heatset, and which has loops and bows, of which at least a part of the loops and bows are freely protruding from the core of the yarn.

4,692,366

FLOCKING ADHESIVES BASED ON EVA-MALEATE COPOLYMERS

Paul R. Mudge, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sep. 8, 1986, Ser. No. 905,352
Int. Cl.[4] B05D *1/14, 1/16;* B32B *3/02, 33/00*
U.S. Cl. 428—90 18 Claims

12. A process for manufacturing a flocked article which comprises the steps of:

(I) applying to the substrate to be flocked a composition comprising a flocking adhesive composition characterized

by an excellent balance of softness and strength, comprising sufficient thickener selected from the group consisting of hydroxyethylcellulose, carboxymethylcellulose, polyacrylate-hydrolyzed acrylonitrile and carboxylic acid/acrylate emulsions or solutions to provide a viscosity of 10,000 to 30,000 cps., pigments, 0–10% by weight of the solids of a foaming agent comprising a water soluble salt of an aliphatic carboxylic acid containing 16 to 20 carbon atoms, and an aqueous emulsion, the latter prepared by the emulsion polymerization of a copolymer consisting essentially of:

(a) a vinyl ester of an alkanoic acid having 1 to 13 atoms interpolymerized with the following comonomers:

(b) 10 to 30% by weight of ethylene;

(c) 15 to 40% by weight of a C_4–C_{10} dialkyl maleate or the corresponding fumarate;

(d) 1 to 5% by weight of N-methylol acrylamide or N-methylol methacrylamide;

(e) 0 to 4% by weight of an olefinicially unsaturated carboxylic acid having 3 to 6 atoms; and

(f) 0 to 1% by weight of a polyethylenically unsaturated comonomer; the vinyl ester being added in an amount to total 100%; said adhesive being applied in an amount of 0.5 to 3.0 ounces per square yard;

(II) applying the flocking fibers to the coated substrate; and

(III) drying the flocked substrate.

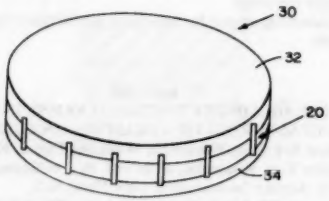
18. A flocked article formed by the process of claim **12**.

4,692,367

METHOD OF MAKING A THERMALLY STABLE COMPOSITE HONEYCOMB PANEL

Mark A. Richter, Jupiter, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 24, 1986, Ser. No. 856,064
Int. Cl.[4] B32B *7/04, 31/20*
U.S. Cl. 428—116 **2 Claims**



1. A method for forming a thermally stable honeycomb panel comprised of a core member, a faceplate member, and a backplate member with each of said members being constructed of one or more thermally stable composite planks comprised of about 50% graphite fibers and of about 50% borosilicate glass and formed by hot pressing in vacuum, said method comprising first constructing a core member by a process A which comprises completing the steps (i-vii) of said process A as follows:

(i) providing a plurality of said thermally stable composite planks having a predetermined length of l, predetermined width of w, and predetermined thickness of t;

(ii) notching said planks individually along said length of l to form a series of equally spaced notches with a depth equal to ½w and a width equal to t;

(iii) applying to each of said notched surfaces, a wet frit paste which additionally contains a volatile carrier to adjust fludity, said wet frit paste comprised of a borosilicate glass suspended in an organic binder designed to boil out completely below the glass melting temperature of said thermally stable planks, said borosilicate glass having a thermal expansion of from about 67 to about 46×10^{-7} inch/inch/°C. over the temperature range from 0° C.–300° C. and a glass melting temperature of about 450° C. to about 600° C.;

(iv) assembling said plurality of notched planks to form a series of square honeycomb cells and then allowing the assembled plurality of notched planks to dry at room temperature for a predetermined time period to allow the volatile carrier to evaporate;

(v) completing a bonding process for the dried assembly which comprises placing the dried assembly in an oven in an air atmosphere and heating to a predetermined temperature which is melting point of the glass contained in said frit;

(vi) maintaining the predetermined temperature long enough to ensure that the entire dried assembly has reached the proper temperature to achieve bonding;

(vii) turning the oven off and allowing the dried assembly to cool to room temperature to yield a thermally stable core member; and said method further comprising completing process B set forth hereinbelow for forming said thermally stable honeycomb panel having said core member with a faceplate member and a backplace member bonded at the respective top and bottom outer surfaces thereof of said core member, said process B comprising completing the additional steps (viii–xi) of said process B as follows:

(viii) providing a pair of said thermally stable composite planks of a predetermined length, width, and thickness to serve as a faceplate member and backplate member of said core member when bonded thereto;

(ix) applying a wet frit paste, as defined in step (iii) of process A hereinabove, to the joining surface of said faceplate member and said backplate member and to said core member;

(x) placing said backplate member on a flat surface, placing said core member with applied wet frit paste on top and bottom of exposed thermally stable plank edges, placing said faceplate member on top of said core member, and then allowing said core member, faceplate member, and backplate member to dry at room temperature for a predetermined time period to allow volatile carrier to evaporate; and

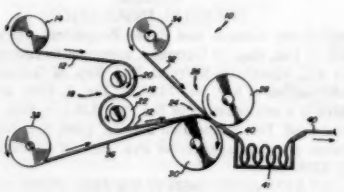
(xi) completing an equivalent bonding process for the dried honeycomb panel comprised of said core member, said backplate member, and said faceplate member as defined in steps (v–vii) of process A hereinabove and additionally applying a small load on top of said faceplate member to ensure contact between the parts being bonded during said bonding process to thereby complete the forming of a thermally stable honeycomb panel.

4,692,368

ELASTIC SPUNLACED POLYESTER-MELTBLOWN POLYETHERURETHANE LAMINATE

Jack D. Taylor, Roswell, and L. Warren Collier, IV, Dunwoody, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 15, 1986, Ser. No. 919,297
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—137 **22 Claims**



1. A laminate which is elastic in at least one direction, said laminate comprising:

an elastic sheet comprising a polyetherurethane material;

at least one nonelastic nonwoven web of spunlaced hydraulically entangled polyester fibers joined to said elastic sheet at least at two areas, said nonelastic web being gathered between said two areas.

4,692,369

WATER-VAPOR-PERMEABLE, WATERPROOF, HIGHLY ELASTIC FILMS

Haruo Nomi, Wake, Japan, assignor to Japan Gore-Tex, Inc., Japan

Filed Dec. 9, 1985, Ser. No. 806,702
Claims priority, application Japan, Dec. 11, 1984, 59-259968
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—198 4 Claims

1. A water-vapor-permeable, gas impermeable, liquid waterproof, highly elastic composite film comprising a film of expanded, porous, unsintered polytetrafluoroethylene having completely impregnated within its pores a water-vapor-permeable polymeric resin, said composite film having elongation percentage in at least one direction exceeding 40% and durability in repeated stretching to 80% of its elongation percentage of more than 200,000 cycles.

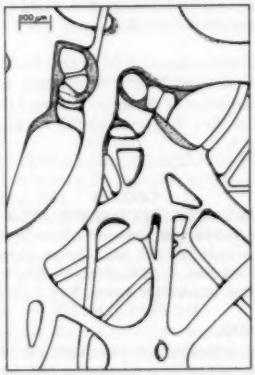
4. The composite film of claim 1 laminated to a two-way stretch fabric by a point-to-point adhesive wherein the total adhesion area coverage is about 40%.

4,692,370

PROCESS FOR NONSLIP FINISHING OF SMOOTH SURFACES OF OBJECTS AND OBJECTS PRODUCED THEREBY

Erich Reckziegel, and Heinz Holzapfel, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,853
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3431002; Oct. 5, 1984, 3436620
Int. Cl.[4] B32B *27/12*; B05D *1/02, 5/02*
U.S. Cl. 428—198 11 Claims



1. A process for the nonslip finishing of smooth surfaces of plastic objects consisting essentially of applying to said smooth surfaces a coating of a fine-filament hotmelt thermoplastic polymer in the form of a microfine random-strand nonwoven, the diameter of the filaments of said nonwoven being essentially beteen 300 and 10 µm, the random-strand nonwoven filaments being welded firmly to one another where they cross, said nonwoven being applied in 1 to 4 layers, said coating being applied to said smooth surfaces from 0.5 to 2.5 mm diameter nozzles at temperatures of from 150° to 210° C. and under an excess pressure of from 0.5 to 8 bar, whereby some adhesion of said coating to said smooth surfaces occurs but whereby said smooth surfaces are not appreciably melted.

3. Plastic objects having the nonslip surfaces produced by the process of claim 1.

4,692,371

HIGH TEMPERATURE METHOD OF MAKING ELASTOMERIC MATERIALS AND MATERIALS OBTAINED THEREBY

Michael T. Morman, Alpharetta, Ga., and Tony J. Wisneski, Kimberly, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 30, 1985, Ser. No. 760,366
Int. Cl.[4] D01F *6/28*; C08F *297/04*
U.S. Cl. 428—224 12 Claims

1. A nonwoven elastomeric material comprising a coherent matrix of entangled elastomeric fibers having a diameter of from about 0.5 micron to about 100 microns, said fibers consisting essentially of an A-R-A′ block copolymer where A and A′ are each a thermoplastic endblock containing a styrenic moiety and B is a poly(ethylene-butylene) midblock.

4,692,372

CEILING AND WALL TILE

William S. Parkinson, Dallas, and Villy E. Djerf, Grand Saline, both of Tex., assignors to Bunker Plastics, Inc., Grand Saline, Tex.

Filed Jun. 25, 1986, Ser. No. 878,250
Int. Cl.[4] D04H *1/16*; B32B *7/12, 15/04, 17/06*
U.S. Cl. 428—282 14 Claims

1. A tile, comprising a light-transmitting film layer of polycarbonate, said film layer having a mirrored backing on one side thereof and having another side opposite said one side being left uncovered, a backing means for providing dimensional stability for said tile, and means for securing said backing means to said mirrored backing.

2. A tile as defined in claim 1 in which said backing means includes a fiber board formed from glass fibers and compressed into flattened form and having a phenolic coating sprayed thereon.

4,692,373

LAMINATE BONDED BY ADHESION PROMOTING LAYER AND ADHESIVE LAYER

Martin Welz, Bad Duerkheim; Bernhard Czauderna, Hirschberg, and Karl-Heinz Stoffel, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 782,929

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436820

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—285 8 Claims

1. A laminate comprising a layer A of a polyolefin, reinforced with from 10 to 50% by weight of glass fiber mats, and a layer D of a metal, which are bonded to one another by means of a mechanically adhesion-promoting layer B and an adhesive layer C, wherein the adhesive is a thermoplastic polyurethane elastomer, wherein the adhesion promoting layer B is a non-woven fabric which is anchored in the polyolefin layer.

4,692,374

ANTIMICROBIALLY ACTIVE, NON-WOVEN WEB USED IN A WET WIPER

Michael P. Bouchette, Appleton, Wis., assignor to James River Corporation, Richmond, Va.

Division of Ser. No. 772,845, Sep. 5, 1985, Pat. No. 4,615,937. This application Jul. 16, 1986, Ser. No. 886,073

The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—288 27 Claims

19. An antimicrobially active wet wiper comprising:

(a) an antimicrobially active non-woven web comprising:

(i) bonded fibers;

(ii) a binder in an amount effective to bind the fibers;

(iii) an antimicrobial agent being substantive to the fibers and to the binder when the web is either wet or dry to prevent the antimicrobial agent from substantially diffusing from the fibers or the binder; and

(b) a substantially preservative free liquid in which the web is maintained in a wet condition until use.

4,692,375

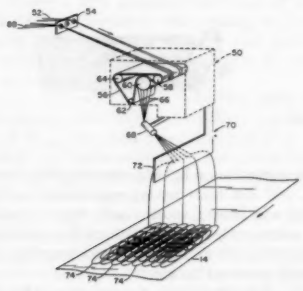
THERMOPLASTIC SHEET

Jeffrey A. Neubauer, Lewisville, Tex.; Walter J. Reese, North Huntington, Pa., and Dennis O. Spencer, Shelby, N.C., assignors to Azdel, Inc., Shelby, N.C.

Continuation of Ser. No. 861,797, May 12, 1986, abandoned, which is a division of Ser. No. 780,777, Sep. 27, 1985, Pat. No. 4,615,717. This application Mar. 5, 1987, Ser. No. 22,614

Int. Cl.[4] B32B *5/06*

U.S. Cl. 428—299 12 Claims



1. A thermoplastic fiber glass reinforced sheet comprising a thermoplastic resin filled mat of glass fiber strands which have been needled and wherein the mat is formed from loops of continuous glass strands which are elliptical and loops of continuous glass strands which are circular, the majority of the strands being elliptical and the long axis of the elliptical loops being parallel to each other and one side of the sheet.

4,692,376

MICROPOROUS COATING FOR SOLID MEMBERS TO REDUCE STRESS, WEAR AND FATIGUE AT LIQUID INTERFACES

Daniel H. Deutsch, 141 Kenworthy Dr., Pasadena, Calif. 91105

Filed Dec. 1, 1986, Ser. No. 936,128

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—315.5 13 Claims

1. A surface coating for areas of a solid member which are subject to high negative pressure in a liquid, comprising

a porous outer layer of material affixed to the solid member which is non wetted by the liquid and has an average pore diameter in the range of about 10^{-6} mm to 1 mm.

4,692,377

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

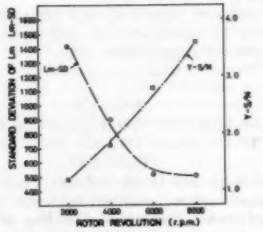
Hiroshi Ota, Komoro, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,447

Claims priority, application Japan, Jul. 1, 1985, 60-142604

Int. Cl.[4] G11B *5/70, 5/716*

U.S. Cl. 428—323 2 Claims



1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer coated on the support, said recording layer consisting of a ferromagnetic powder dispersed in a binder, characterized in that said ferromagnetic powder is selected from ferromagnetic powders which satisfy the multiple regression formula:

Y-S/N$=-0.0006\times Em+0.5707\times(Lm/Wm)-0.0005\times(Lm\text{-}SD)+4.6424$ and Y-S/N being more than 2 and the standard deviation of the formula being 2.0 or less, where Y-S/N, Lm, Em, Wm and Lm-SD are as defined in the specification.

4,692,378

MAGNETIC RECORDING MEDIA

Heigo Ishihara, Tokyo, and Tomoyuki Ohno, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,261

Claims priority, application Japan, Nov. 7, 1984, 59-233148

Int. Cl.[4] G11B *5/71*

U.S. Cl. 428—340 10 Claims

1. Magnetic recording medium having a lubricating film thereon which comprises a lubricating film containing polar perfluoroalkylpolyether with a polar terminal group and a nonpolar perfluoroalkylpolyether without a polar terminal group being laid on the surface of a magnetic recording medium having a magnetic layer comprising a film formed of a

material selected from the group consisting of a magnetic metal, a magnetic oxide and magnetic powders dispersed in a thermosetting binder; a coating weight of the polar and nonpolar perfluoroalkylpolyethers on the surface of the magnetic recording medium being 10 to 100 mg/m^2, and a ratio of coating weight of the nonpolar perfluoroalkylpolyether to that of the polar perfluoroalkylpolyether being 0.5–4:1.

4,692,379

HEAT SEALABLE FILM AND METHOD FOR ITS PREPARATION

Jay K. Keung, Macedon, N.Y.; Kevin M. Donovan, Milford, Conn., and Ricardo Balloni, Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,159

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—349 **22 Claims**

1. An oriented, heat sealable polymer film laminate possessing a low coefficient of friction, good receptivity for water-based coatings and good optical clarity which comprises:

(a) an upper heat sealable, water-based coating-receiving layer coextensively adherent to the upper surface of a core layer (b), said upper layer (a) being formed from a polymer selected from the group consisting of ethylene-propylene-butene-1 terpolymer, ethylene-propylene random copolymer and blends thereof, said polymer being compounded with an anti-blocking effective amount of anti-blocking agent but being substantially devoid of silicone oil, the exposed surface of upper layer (a) being coated with a coefficient of friction-reducing amount of silicone oil transferred to said surface through contact with a silicone oil coating present upon the exposed surface of a lower heat sealable surface layer (c);

(b) a core layer derived from an isotactic polypropylene; and,

(c) a lower heat sealable layer coextensively adherent to the lower surface of core layer (b), said lower layer (c) being formed from a polymer selected from the group consisting of ethylene-propylene-butene-1 terpolymer, ethylene-propylene random copolymer and blends thereof, said polymer being compounded with an anti-blocking effective amount of anti-blocking agent and a quantity of silicone oil such that a coefficient of friction-reducing amount thereof will be present on the exposed surface of layer (c) as well as the exposed surface of layer (a) following mutual contact of said surfaces.

4,692,380

METALLIZABLE POLYPROPYLENE FILM

Donald E. Reid, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 762,905, Aug. 6, 1985, Pat. No. 4,604,322. This application Apr. 21, 1986, Ser. No. 854,202

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.[4] B32B *15/08, 15/20*

U.S. Cl. 428—349 **7 Claims**

1. A polypropylene film comprising a homopolypropylene core containing about 0.03 to 0.15% by weight based on the polymer of a fatty acid amide slip agent and having on one of its surfaces a 1 to 20 gauge layer comprised of a corona-treated propylene-ethylene copolymer containing about 1 to 10 wt. % ethylene and having no slip agent included therein and having a metal coating applied to said corona-treated layer.

4,692,381

FOAMABLE POLYVINYLIDENE FLUORIDE AND METHODS

Roger L. Pecsok, Berwyn, assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 885,978, Jul. 15, 1986, Pat. No. 4,675,345, which is a division of Ser. No. 630,924, Jul. 16, 1984, Pat. No. 4,615,850. This application Mar. 9, 1987, Ser. No. 23,172

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—375 **9 Claims**

1. A foamed polyvinylidene fluoride material consisting essentially of a polymer selected from the group of polymers consisting essentially of a homopolymer of polyvinylidene fluoride, copolymers or terpolymers containing a major portion of vinylidene fluoride with at least one copolymerizable monomer selected from the group consisting essentially of hexafluoropropylene, trifluoroethylene, chlorotrifluoroethylene and tetrafluoroethylene and mixtures of the homopolymer, copolymer, and terpolymer; said polymer having from 0.25 to 5.0 percent by weight of the polymer of a nucleating agent of discreet, insoluble particles with an average size distribution less than about 5 microns in the longest dimension dispersed throughout the polymer, and uniformly dispersed therein 0.05 to 5.0 percent by weight of the polymer of (i) of a dispersing aid selected from the group consisting of dialkyl phthalate, dibutoxyethyl phthalate, diisononyl phthalate, ditridecyl phthalate, dicyclohexyl phthalate, diphenyl alkyl adipate, methyl phthalyl ethyl glycolate, and diethylene glycol monobutyl ether; said material having a void content within the range of 35% to 55% and a corresponding density of 1.15 to 0.80 g/cc.

4,692,382

ELASTOMERIC COATING COMPOSITIONS

Robert J. Schmitt; Leon A. Perez, both of Pittsburgh; Robert A. Montague, Allison Park; Marvin T. Tetenbaum, Pittsburgh, and Ellor J. Van Buskirk, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1986, Ser. No. 887,455

Int. Cl.[4] B32B *27/38;* B05D *3/02;* C08F *283/00*

U.S. Cl. 428—414 **26 Claims**

17. A method of providing a substrate with a multilayer coating comprising:

(a) applying a flexible primer coating composition to a substrate, said coating composition comprising (i) an isocyanate terminated urethane containing material; and (ii) a phosphatized polyepoxide essentially free of oxirane groups.

(b) applying at least one pigmented coating composition to the coated substrate of (a);

(c) at least partially curing the coated substrate of step (b); said multilayer coating having an elongation of at least 50 percent when cured.

26. A coated article produced by the method of claim 17.

4,692,383

POLYCARBONATE BASED ELASTOMERIC COATING COMPOSITIONS

Robert J. Schmitt; Leon A. Perez, both of Pittsburgh; Robert A. Montague, Allison Park, and Marvin T. Tetenbaum, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1986, Ser. No. 887,456

Int. Cl.[4] B32B *27/38;* B05D *3/02;* C08F *283/00*

U.S. Cl. 428—414 **29 Claims**

20. A method of providing a substrate with a multilayer coating comprising:

(a) applying a flexible primer coating composition to a substrate, said coating composition comprising a material or mixture of materials adapted to provide a source of (i) carbonate moieties, (ii) isocyanate groups; and (iii) phosphatized polyepoxide essentially free of oxirane groups;

(b) applying at least one pigmented coating composition to the coated substrate of (a);

(c) at least partially curing the coated substrate of step (b); said multilayer coating having an elongation of at least 50 percent when cured.

29. A coated article produced by the method of claim 20.

4,692,384

POLYESTER POLYOLS AND THEIR USE AS POLYOL COMPONENT IN TWO COMPONENT POLYURETHANE LACQUERS

Josef Pedain, Cologne; Klaus König, and Manfred Schönfelder, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 737,603, May 24, 1985, Pat. No. 4,656,243.
This application Oct. 28, 1986, Ser. No. 923,986
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421122
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—423.3 6 Claims

1. A coated, molded plastics part prepared by coating a molded plastics part with a polyurethane prepared from a polyisocyanate and a polyol component comprising a polyester polyol having a hydroxyl number range of about 80 to 250 and which is reaction product of

(a) 54–58 mol-% of a polyol component comprising (i) about 70 to 90 mol-% of hexane-1,6-diol and (ii) about 10 to 30 mol-% of at least one higher hydric alcohol selected from the group consisting of trimethylolpropane, glycerol, pentaerythritol and mixtures of these polyols, and

(b) 42–46 mol-% of a dicarboxylic acid component comprising (iii) about 50 to 80 mol-% of isophthalic acid, (iv) about 20 to 30 mol-% of at least one dicarboxylic acid of the formula $HOOC—(CH_2)_n—COOH$, wherein n is an integer from 2 to 8, and (v) up to about 20 mol-% of at least one dicarboxylic acid or at least one dicarboxylic acid anhydride selected from the group consisting of terephthalic acid, phthalic acid, phthalic acid anhydride, tetrahydrophthalic acid, tetrahydrophthalic acid anhydride, hexahydrophthalic acid and hexahydrophthalic acid anhydride.

4,692,385

TRIPLEX ARTICLE

Philip C. Johnson, Lexington, Mass., assignor to Materials Development Corporation, Medford, Mass.

Filed Apr. 14, 1986, Ser. No. 851,086
Int. Cl.[4] B22D *25/00*
U.S. Cl. 428—469 27 Claims

1. A coated article comprising an alloy substrate of an alloy selected from the group consisting of iron, nickel, cobalt and titanium base alloys, a diffusion layer formed thereon comprising an intermetallic boride of the substrate alloy, a coating on said layer of a material selected from the group consisting of refractory, ceramic and intermetallic compounds having desired wear and/or corrosion resistent properties superior to those of said alloy substrate.

4,692,386

SEALABLE MULTILAYER POLYOLEFIN FILMS

Ingo Schinkel, Walsrode, and Jürgen Böhner, Bomlitz, both of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,772
Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517082
Int. Cl.[4] B32B *27/08, 27/32*
U.S. Cl. 428—515 10 Claims

1. A heat-sealable, at least monoaxially-oriented multiple-layer film which comprises a base layer comprising a polymer of propylene and optionally up to 10%, by weight, of one or more other up to C_8 α-olefins and at least one sealable layer comprising:

(a) from 66.5 to 94.5%, by weight, of a linear, statistical low-density ethylene copolymer (LLDPE);

(b) from 5 to 30%, by weight, of a low molecular weight resin compatible with (a); with the exception of a low molecular weight resin of α-olefins containing at most 3 carbon atoms;

(c) from 0.3 to 2%, by weight, of a mixture of a polyethylene wax and an oxazoline wax;

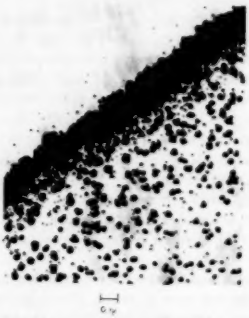
(d) from 0.2 to 1.5%, by weight, of polydiorganosiloxane.

4,692,387

SINTERING OF METAL INTERLAYERS WITHIN ORGANIC POLYMERIC FILMS

Shymon Reich, Rehovoth, Israel, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 657,011, Oct. 2, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 874,817
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—545 19 Claims



1. Process for modifying in situ the electrical and/or optical properties of an electrochemically-deposited interlayer within a polyimide film, the interlayer being comprised of particulate silver and/or gold, by heating the interlayer, either in its entirety or in a spatially selective manner, so as to sinter the particulate silver and/or gold without adversely affecting the properties of the polyimide.

4,692,388

LAMINATED ARTICLE

Henry W. Lavendel, Palo Alto, and John C. Robinson, Cupertino, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 747,635, Jun. 24, 1985. This application Dec. 2, 1986, Ser. No. 939,826
Int. Cl.[4] B32B *7/04*
U.S. Cl. 428—621 1 Claim

1. A first and a second substrate material mated together, said materials being selected from the group of materials consisting of metals and ceramics, and a solid boron-silicon-hydrogen alloy film at the interface between said first and second substrate material, wherein said film bonding said first and second substrate material together has been heat treated at a temperature sufficient to convert said boron-silicon-hydrogen film to solid boron-silicon alloy film which reacts with at least one substrate material to form a liquid reaction product which chemically interacts with said material.

4,692,389

STAINLESS STEEL OVERCOAT FOR SPUTTERED FILMS

F. Howard Gillery, Allison Park, and Russell C. Criss, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 530,570, Sep. 9, 1983, Pat. No. 4,594,137. This application Mar. 17, 1986, Ser. No. 840,259
Int. Cl.[4] C03C 27/02, 27/04
U.S. Cl. 428—622 6 Claims

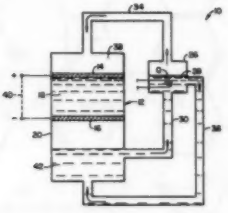
1. An article of manufacture comprising:
a. a transparent nonmetallic substrate;
b. a transparent coating of a metal selected from the group consisting of silver, copper, gold, platinum, palladium and mixtures thereof; and
c. a transparent protective overcoat comprising a metal having a dense oxide surface layer.

4,692,390

METHOD AND SYSTEM FOR HYDROGEN THERMAL-ELECTROCHEMICAL CONVERSION

Prodyot Roy, Saratoga, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Aug. 18, 1986, Ser. No. 897,243
Int. Cl.[4] H01M 8/06
U.S. Cl. 429—17 12 Claims



1. A method for producing electricity, said method comprising:
flowing hydrogen through an electric conversion cell comprising a pair of spaced-apart solid metal electrodes which are permeable to hydrogen and which have an electrolyte therebetween chosen to selectively pass ionized hydrogen, whereby an electric current is induced through an external circuit connecting the electrodes.

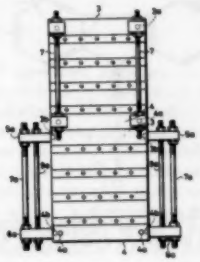
4,692,391

CELL STACK ASSEMBLY STRUCTURE FOR FUEL CELL

Toshio Hirota, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Continuation of Ser. No. 689,977, Jan. 9, 1985. This application Jun. 12, 1986, Ser. No. 873,485
Claims priority, application Japan, Jan. 10, 1984, 59-1519[U]
Int. Cl.[4] H01M 2/00, 2/08
U.S. Cl. 429—34 9 Claims

1. A subassembly of a fuel cell, wherein said fuel cell is comprised of a plurality of stacked arrays of fuel cell elements, said subassembly comprising:
a plurality of planar fuel cell elements stacked adjacent the planar sufaces of one another to form an array;
a pair of planar end plates on each planar end of said array, said end plates being disposed to compress said array in a direction perpendicular to the planar surface of said elements;
an end plate engaging means which is disposed to allow the end plate of one array to abut the end plate of an adjacent array while pressure is applied to each of said arrays, and which is removable while the end plate of one array is disposed to abut the end plate of the adjacent array; and
fastening means passing outside said array and engaging said end plate engaging means, said fastening means upon engaging said end plate engaging means being adjustable



for applying a selected tension to said end plate engaging means to induce said pressure to said array through said end plates.

4,692,392

COLOR ELECTROPHOTOGRAPHIC PROCESS USES LAYERED PHOTOSENSITIVE ELEMENT HAVING CONDUCTIVE FILM ON SIDE PORTION

Kenichi Ichimura, Moriyama, and Hiroshi Ichida, Kusatsu, both of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Jun. 4, 1986, Ser. No. 873,432
Claims priority, application Japan, Jun. 10, 1985, 60-125895
Int. Cl.[4] G03G 5/08, 13/22
U.S. Cl. 430—46 16 Claims

1. In a color electrophotography process comprising sequentially repeating the imaging steps of supporting photosensitive material sheet on a conductive conveyor, charging said photosensitive material sheet, exposing said charged photosensitive material sheet to an optical image to form an electrostatic latent image, and developing said latent image with a liquid developer to produce a toner image, thereby to superpose multicolor toner images, the improvement wherein said photosensitive material sheet comprises:
a base sheet having an extremely smooth surface and high specific resistivity;
a conductive layer on one face of said base sheet;
a photosensitive coating including titanium dioxide dispersed in an insulating resin on said conductive layer;
a conductive film on at least a side edge portion of said photosensitive material sheet and on at least a part of the face of said base sheet opposite said one face, said one face being essentially free of said conductive film, whereby said photosensitive material sheet is grounded, through said conductive layer, to said conductive conveyor.

4,692,393

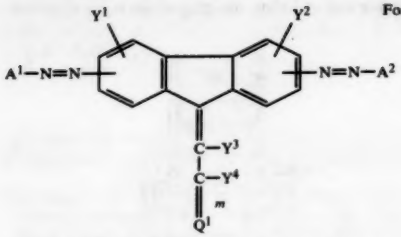
PHOTORECEPTOR HAVING A PHOTOSENSITIVE LAYER CONTAINING AN AZO COMPOUND

Akira Kinoshita; Kazumasa Watanabe; Hiroshi Yamazaki, and Naohiro Hirose, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

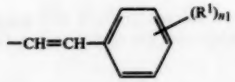
Filed Oct. 28, 1985, Ser. No. 791,793
Claims priority, application Japan, Oct. 31, 1984, 59-229793
Int. Cl.[4] G03G 5/06, 5/14
U.S. Cl. 430—59 48 Claims

1. A photoreceptor comprising a support and thereon a photosensitive layer containing an azo compound represented by the following Formula [I]

Formula [I]

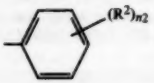


wherein Y^1 and Y^2 each represent hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, or



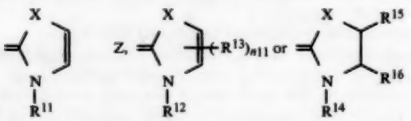
in which R^1 represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acryl group, a dialkylamino group, a diarylamino group, a diaralkylamino group, or a hydroxy group; and n_1 is an integer of from 1 to 5, provided that, when n_1 is not less than 2, R^1 is allowed to be a different substituent;

Y_3 and Y_4 each represent hydrogen, an alkyl group, a halogen, a cyano group, an acyl group, an ester group, or

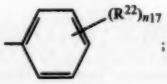


in which R^2 represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano gradation, an ester group, an acyl group, a dialkylamino group, a diarylamino group, a diaralkylamino group, or a hydroxy group; and n_2 is an integer of from 1 to 5, provided that, when n_2 is not less than 2, R^2 is allowed to be a different substituent;

Q^1 represents

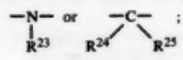


in which Z represents a group of atoms necessary for forming a substituted or unsubstituted aromatic carbon ring or a substituted or unsubstituted aromatic heterocyclic ring; R_{11}, R_{12} and R_{14} each represent hydrogen, an alkyl group, an aralkyl group, or



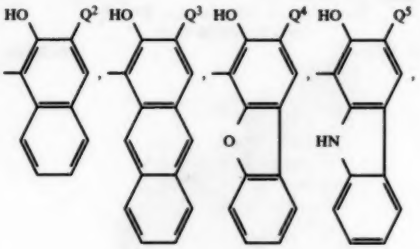
;

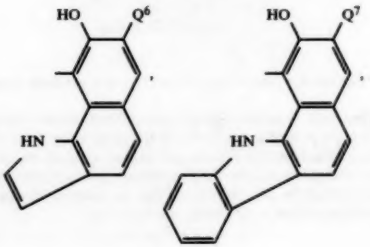
R^{13}, R^{15} and R^{16} and R_{22} each represent hydrogen, an alkyl group, an aryl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, a diaralkylamino group, a diarylamino group, a nitro group, an amino group, or a hydroxy group; n_{11} is an integer of 1 or 2; n_{17} is an integer of from 1 to 5, provided that, when n_{11} and n_{17} are not less than 2, respectively, R^{13} and R^{22} are allowed to be the same or different from each other, respectively, and it is also allowed to form an aliphatic carbon ring or an aliphatic heterocyclic ring with R^{15} and R^{16}; X represents —O—, —S—,

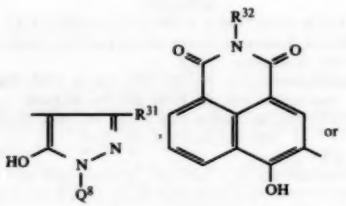


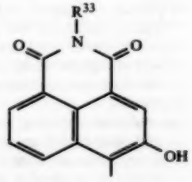
R^{23} represents hydrogen, an alkyl group, an aralkyl group, or a phenyl group allowed to have a substituent; R_{24} and R_{25} each represent hydrogen, an alkyl group, an aralkyl group, or a phenyl group allowed to have a substituent;

A^1 and A^2 each represent

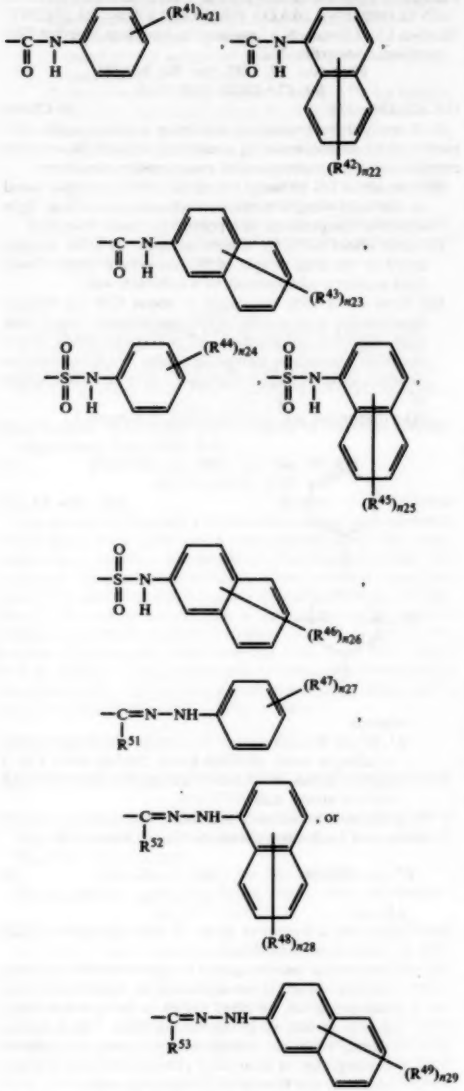




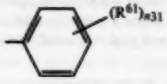




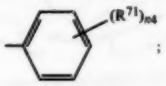
in which Q^2, Q^3, Q^4, Q^5, Q^6 and Q^7 represent



in which R^{41}, R^{42}, R^{43}, R^{44}, R^{45}, R^{46}, R^{47}, R^{48} and R^{49} each represent hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, an diaralkylamino group, a diarylamino group, or a hydroxy group, and n_{21}, n_{24} and n_{27} are an integer of from 1 to 5, provided that, when n_{21}, n_{24} and n_{27} are not less than 2, R^{41}, R^{44} and R^{47} are allowed to be different substituents from each other, respectively, and n_{22}, n_{23}, n_{25}, n_{26}, n_{28} and n_{29} are an integer of from 1 to 7, provided that, when n_{22}, n_{23}, n_{25}, n_{26}, n_{28} and n_{29} are not less than 2, R^{42}, R^{43}, R^{45}, R^{46}, R^{48} and R^{49} are allowed to be the same or different from each other; R^{51}, R^{52}, and R^{53} each represent an alkyl group; Q^8 represents



in which R^{61} represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, a diaralkylamino group, a diarylamino group, or a hydroxy group, and n_{31} is an integer of from 1 to 5, provided that, when n_{31} is not less than 2, R^{61} is allowed to be a different substituent; R^{31} represents hydrogen, an alkyl group, an amino group, a dialkylamino group, a diarylamino group, a diaralkylamino group, a carbamoyl group, a carboxyl group or the ester groups thereof, or a cyano group; R^{32} and R^{33} each represent an alkyl group, an aralkyl group, or



R^{71} represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, a diaralkylamino group, a diarylamino group, or a hydroxy group, and n_{41} is an integer of from 1 to 5, provided that when n_{41} is not less than 2, R^{71} is allowed to be a different substituent; and m is zero, 1 or 2.

4,692,394

METHOD OF FORMING A PERSONAL INFORMATION CARD

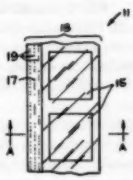
Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Jan. 22, 1985, Ser. No. 693,856

The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.

Int. Cl.[4] G03C *5/14;* B42D *15/00*

U.S. Cl. 430—140 **18 Claims**



1. A method for recording personal information comprising,

creating visually readable information on a piece of photographic material, said information relating to a person,

disposing said visually readable information in a wallet-size card,

disposing a high data capacity laser recordable direct-read-after-write optical data storage lamella in said wallet-size card, and

recording information indicia related to said person onto said optical data storage lamella, in situ, by means of a laser, said laser recorded information indicia being data spots representing changes in reflectivity in a surrounding

optically contrasting field of said lamella, said data spots being spaced at most ten microns apart from edge to edge.

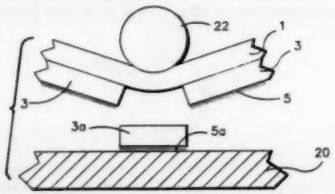
8. The method of claim 1 wherein said information recorded on said lamella is the digital recorded voice of the card owner.

4,692,395

TRANSFER ELEMENT AND PROCESS FOR RADIATION DEFINED IMAGES

Hugh T. Findlay, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,708
Int. Cl.[4] G03C *1/68*; G03F *7/26*
U.S. Cl. 430—254 **8 Claims**



7. The method of applying a colored image to a porous substrate comprising applying a pattern or radiation in the form of said image through the substrate of a transfer medium having a substrate transparent to said radiation, an intermediate layer which cures in response to said radiation to change in melting point and an outer layer comprising a pigment, said pigment being at least 50% by weight of the weight of said outer layer; contacting said outer layer with said porous substrate, and heating during said contacting to flow by melting portion of said intermediate layer having a lower melting point than other portions of said intermediate layer as a result of said curing in response to said radiation.

4,692,396

PHOTOPOLYMERIZABLE RESIN COMPOSITION FOR PRODUCING AQUEOUS-DEVELOPMENT TYPE DRY FILM RESISTS

Hiroyuki Uchida, 5-10, Nishisakae-2-chome, Ohtake-shi, Japan

Filed Apr. 3, 1985, Ser. No. 719,567
Claims priority, application Japan, Apr. 10, 1984, 59-71348
Int. Cl.[4] G03C *1/68*; C08F *8/00*
U.S. Cl. 430—284 **4 Claims**

1. A photopolymerizable resin composition which comprises

(A) 40 to 85% by weight of a binder resin comprising a copolymer of methyl methacrylate, methyl acrylate, and methacrylic acid, wherein the methacrylic acid unit content of the copolymer constituting the binder resin is 20 to 50% by weight and the methyl acrylate unit content of the copolymer constituting the binder resin is 2 to 70% by weight,

(B) 15 to 60% by weight of a crosslinkable monomer having at least two ethylenically unsaturated groups in the molecule, and

(C) 0.5 to 10% by weight, based on the toal amount of the above components (A) and (B), of a photoinitiator.

3. A photopolymerizable resin composition according to claim 1 wherein the crosslinkable monomer is a member selected from the group consisting of polyester acrylate, polyester methacrylates, epoxy acrylate, epoxy methacrylates urethane acrylate and urethane methacrylates.

4,692,397

PROCESS FOR DEVELOPING AN AQUEOUS ALKALINE DEVELOPMENT DIAZO PHOTOGRAPHIC ELEMENT

Shuchen Liu, Clinton, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Nov. 27, 1985, Ser. No. 802,655
Int. Cl.[4] G03F *7/08, 7/26*
U.S. Cl. 430—325 **16 Claims**

1. A method for producing and using a photographic element which comprises coating a substrate with a light sensitive composition, which composition comprises in admixture:

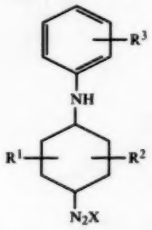
(i) from about 1% by weight to about 21% by weight, based on the total weight of the non-solvent parts of said light sensitive composition, of a polyvinyl acetal resin; and

(ii) from about 1.1% by weight to about 22% by weight, based on the total weight of the non-solvent parts of said light sensitive composition, of a colorant; and

(iii) from about 63% by weight to about 92% by weight, based on the total weight of the non-solvent parts of said light sensitive composition, of a light-sensitive, water insoluble diazonium group-containing polycondensation product, which product is obtained first by condensation of

(a) a diazonium salt corresponding to formula I

(I)



wherein

R^1, $R^2$and R^3each denote separately a hydrogen atom, a halogen atom, an alkyl group having from 1 to 3 carbon atoms, or an alkoxy group having from 1 to 6 carbon atoms, and

X denotes the anion of the diazonium salt;

(b) with a compound corresponding to formula II

$$R^4—O—CH_2—R^5 \quad \text{(II)}$$

wherein

R_4denotes a hydrogen atom, an alkyl group or an aliphatic acyl radical and

R^5denotes a mononuclear or polynuclear aromatic radical, which is unsubstituted or substituted by a halogen atom, an alkyl group, a halogenated alkyl group, an alkoxy group having from 1 to 3 carbon atoms, a carboxy group, an aryl group, an arylmercapto group, or an aryloxy group, in a strongly acidic medium, and thereafter condensing with

(c) a compound corresponding to formula III

$$R^6—O—CH_2—R^8—CH_2—O—R^7 \quad \text{(III)}$$

wherein

$R^6$and R^7 each denote separately a hydrogen atom, an alkyl group, or an aliphatic acyl radical, and

R^8denotes an aromatic hydrocarbon radical selected from the group consisting of a phenol, a phenolether, an aromatic thioether, an aromatic heterocyclic compound, and an organic acid amide,

with the radicals resulting from compound II being directly linked to the units of the diazonium salt I; and thereafter imagewise exposing said coated substrate to actinic radiation and removing all or substantially all of

the non-radiation-exposed areas with a non-organic solvent containing aqueous alkaline developer composition which consists essentially of in admixture:

A. from about 80% by weight to about 95% by weight, based on the weight of said developer composition, water; and

B. from about 7.7% by weight to about 17% by weight, based on the weight of said developer composition, of one or more salts selected from the group consisting of sodium, potassium, and ammonium hydroxides, silicates, phosphates, bicarbonates, oxalates, carbonates, sulfates, chlorides, acetates, benzoates, borates, citrates, salicylates, and pyrophosphates; and

C. from about .3% by weight to about 3.0% by weight, based on the weight of said developer composition, of a anionic surfactant.

4,692,398

PROCESS OF USING PHOTORESIST TREATING COMPOSITION CONTAINING A MIXTURE OF A HEXA-ALKYL DISILAZANE, PROPYLENE GLYCOL ALKYL ETHER AND PROPYLENE GLYCOL ALKYL ETHER ACETATE

Dana Durham, Bloomsbury, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Oct. 28, 1985, Ser. No. 791,876
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—329 **6 Claims**

1. A method of treating a photoresist coating on a substrate, which photoresist comprises a resin selected from the group consisting of novolaks and paravinyl phenols, and at least one o-quinone diazide photosensitizer, which method comprises contacting said photoresist coating for sufficient time to strip, thin, clean or promote adhesion of the coating with a mixture which comprises from about 3 to about 50% by weight of the mixture of a hexa-alkyl disilazane and from about 50 to about 97% by weight of the mixture of a solvent composition which comprises both a propylene glycol mono alkyl ether and a propylene glycol mono alkyl ether acetate.

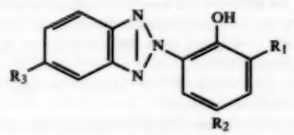
4,692,399

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

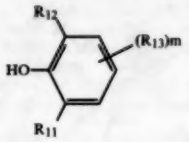
Masao Sasaki; Takashi Kadowaki, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 880,781
Claims priority, application Japan, Jul. 5, 1985, 60-148026
Int. Cl.[4] G03C *1/46*
U.S. Cl. 430—507 **19 Claims**

1. A silver halide photographic light-sensitive material comprising a reflective support end, provided thereon, a light-sensitive silver halide emulsion layer containing a yellow coupler, a light-sensitive silver halide emulsion layer containing a magenta coupler, a light-sensitive silver halide emulsion layer containing a cyan coupler, and a non-light-sensitive layer being provided at a further side of the light-sensitive emulsion layer being provided at the furthest position from said support, wherein said non-light-sensitive layer contains at least three kinds of UV absorbers represented by the general formula



wherein R_1, R_2 and R_3 are independently selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkenyl group, a nitro group and a hydroxy group, provided that one of said UV absorbers is selected from a first class of UV absorbers which are in a liquid state at 30° C. and two of said UV absorbers are selected from a second class UV absorbers which are in a solid state at the same temperature, that said first class UV absorber is present in a proportion of 30% to 99% by weight based on total amount of said UV absorbers and that at least one of said second class UV absorbers has a total of at least 8 carbon atoms in the groups represented by R_1 and R_2 of said general formula [UV-I] and constitutes 35% to 100% by weight of the total amount of said second class UV absorbers, and said emulsion layer containing the yellow coupler contains a compound represented by the general formula [A]:



wherein R_{11} and R_{12} are independently an alkyl group, and R_{13} is an alkyl group, —NR′R″ group, —SR′, or —COOR″ group, wherein R′ is a monovalent organic group and R″ is a hydrogen atom or a monovalent organic group, and m is an integer 0 to 3.

4,692,400

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kenji Kumashiro, Hachioji; Toshifumi Iijima, Kokubunji; Hideo Akamatsu, and Syoji Matsuzaka, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Apr. 29, 1986, Ser. No. 857,024
Claims priority, application Japan, Apr. 30, 1985, 60-92689
Int. Cl.[4] G03C *1/40, 7/34, 1/02*
U.S. Cl. 430—553 **37 Claims**

1. A silver halide photographic light-sensitive material comprising at least one silver halide emulsion layer, wherein said silver halide emulsion layer comprises

a phenol-type cyan coupler having at the 2-position of the phenol nucleus thereof a group selected from the group consisting of a phenyl-ureido group, a naphthyl-ureido group and a heterocyclic ureido group, and having at the 5-position thereof an acylamino group, and

a negative type silver halide grains of a core-shell structure which consists of an inner core essentially consisting of silver bromide or silver iodobromide and a plurality of shells essentially consisting of silver bromide or silver iodobromide, said plurality of shells comprising an outermost shell containing 0 to 10 mol% of silver iodide, a highly iodide-containing shell provided inside said outermost shell of which silver iodide content is at least 6 mol% higher than that of said outermost shell, and an intermediate shell provided between said outermost shell and said highly iodide-containing shell of which a silver iodide content is at least 3 mol% higher than that of said outermost shell, and at least 3 mol% lower than that of said highly iodide-containing shell.

4,692,401

PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING SENSITIZING DYE IN THE FORM OF HOST CRYSTALS

Gary L. House, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 21, 1986, Ser. No. 899,195
Int. Cl.[4] G03C *1/12, 1/19, 1/46*
U.S. Cl. 430—570 12 Claims

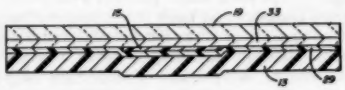
1. A photographic emulsion comprising
grains containing a silver salt capable of forming a latent image,
a sensitizing dye, and
a dispersing medium,
characterized in that
said sensitizing dye is present in the form of host crystals and said grains are in conductive contact with said host dye crystals.

4,692,402

ULTRATHIN OPTICAL RECORDING MEDIUM WITH MOISTURE BARRIER

Eric Bouldin, Atherton; Richard Haddock, and Christopher J. Dyball, both of Redwood City, all of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 831,652, Feb. 20, 1986, abandoned. This application May 2, 1986, Ser. No. 859,116
Int. Cl.[4] G01D *9/00, 15/24;* B32B *3/00*
U.S. Cl. 430—945 25 Claims



1. An optical data storage medium comprising,
a laser recordable data storage material disposed on a substrate, and
a transparent, hydrophobic laminating sheet covering said storage material, the substrate, storage material and laminating sheet having a maximum total thickness not exceeding 40 mils.

4,692,403

METHODS AND COMPOSITIONS FOR THE DETECTION OF ACQUIRED IMMUNE DEFICIENCY SYNDROME

Luther E. Lindner, College Station, and Stephen R. Wechter, Houston, both of Tex., assignors to The Texas A&M University System, College Station, Tex.

Filed Nov. 28, 1984, Ser. No. 675,601
Int. Cl.[4] C12Q *1/70;* G01N *33/53, 33/566, 33/554*
U.S. Cl. 435—5 12 Claims

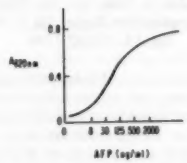
1. A method of immunodiagnosing Acquired Immune Deficiency Syndrome in a suspected carrier comprising:
(a) admixing a lymphoid cell sample obtained from the suspected carrier with an immunoreagent comprising tracer tagged antibodies selectively reactive with AIDS infected tissue, said antibodies obtained from marmoset monkeys, wherein the marmoset monkeys are either afflicted with or have recovered from marmoset wasting syndrome;
(b) incubating the admixture under conditions to form an immune complex; and
(c) detecting a positive immunoreaction which is indicative of Acquired Immune Deficiency Syndrome.

4,692,404

METHOD OF MEASURING BIOLOGICAL LIGAND BY THE USE OF ENZYMES

Yoshihiro Ashihara, and Yasushi Kasahara, both of Tokyo, Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,764
Claims priority, application Japan, Nov. 18, 1983, 58-217145; Dec. 9, 1983, 58-231241
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.
Int. Cl.[4] C12Q *1/34, 1/40;* G01N *33/536*
U.S. Cl. 435—5 14 Claims



1. A method of determining a biological ligand which comprises,
using an antibody or ligand binding fragments thereof, against the ligand to be measured and an enzyme capable of acting on a water-insoluble macromolecular substrate and which conjugates with said antibody or ligand binding fragments thereof,
contacting said antibody or ligand binding fragments thereof, with said ligand,
contacting said enzyme with a water-insoluble macromolecular substrate, and
thereafter measuring the change in activity of the enzyme after it has acted on said substrate, relating said change in the activity of the enzyme to the concentration of the ligand.

4,692,405

MONOCLONAL ANTIBODIES TO ANTIGEN ON ACTIVATED HUMAN B-CELLS AND ASSAY THEREFOR, PROTEIN ANTIGENIC DETERMINANT THEREFOR AND METHOD OF MAKING SAME

Arnold Freedman; Lee Nadler, both of Newton, and Stuart Schlossman, Newton Center, all of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Filed Mar. 5, 1985, Ser. No. 708,176

Int. Cl.[4] G01N *53/00, 33/53;* C12P *21/00;* C12N *5/00*

U.S. Cl. 435—7 **22 Claims**

1. A monoclonal antibody recognizing an antigenic determinant on activated human B-cells, said antigenic determinant being characterized in that it is a protein distinct from B-LAST-1 and BB-1 and is a protein on the surface of activated B-cells having an apparent molecular weight of approximately 75,000 daltons under reducing conditions and 67,000 daltons under non-reducing conditions, said antibody being a protein of the IgM isotype and being reactive with less than 1% of unstimulated human B-cells, with less than 6% of stimulated or resting T-cells and monocytes, and unreactive with neoplasms of non-B-cell origin, or neoplasms of B-cell origin corresponding to stages of differentiation other than the mid-stage of B-cell differentiation.

4,692,406

PROCESS AND A REAGENT FOR THE SIMULTANEOUS DETERMINATION OF FIBRINOGEN AND FIBRINOGEN FISSION PRODUCTS IN PLASMA

Udo Becker, Marburg, and Peter Roeschlau, Seeshaupt, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,421

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330699

Int. Cl.[4] C12Q *1/56*

U.S. Cl. 435—13 **12 Claims**

1. A process for the simultaneous determination of fibrinogen and fibrinogen fission products in plasma, comprising adding 0.01 to 1U of a snake venom enzyme with thrombin-like activity per ml. of sample plasma, measuring the period of time between the addition of the enzyme and the commencement of a turbidity formation as a measure of the amount of fibrinogen fission products, and subsequently measuring the speed of the turbidity formation as a measure of the amount of fibrinogen.

4,692,407

METHOD FOR THE DETERMINATION OF *STREPTOCOCCUS MUTANS*

Harold V. Jordan, Wellesley Hills, Mass., and Max Marmel, Toronto, Canada, assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed Jan. 31, 1985, Ser. No. 696,593

Int. Cl.[4] C12Q *1/14;* C12N *1/20*

U.S. Cl. 435—36 **13 Claims**

1. A method for the quantitative determination of *Streptococcus mutans* in a test sample, which method comprises:

(a) adding to an aseptic, aqueous, diluent solution a predetermined amount of a bacitracin composition and a test sample, taken from the oral cavity of a patient, on which a quantitative determination of *Streptococcus mutans* is to be made;

(b) uniformly wetting an aseptic flat surface dip slide having at least one side coated with a selected medium and a saccharide compound with the bacitracin-test sample diluent solution, both the saccharide compound and the bacitracin present in combination on wetting the slide in a concentration insufficient to prevent the growth of *Streptococcus mutans,* but sufficient to prevent the growth in sufficient quantities of any interfering microorganisms;

(c) incubating the wetted slide in an atmosphere containing carbon dioxide for a defined incubation time an temperature; and

(d) quantitatively determining the amount of the *Streptococcus mutans* of the test sample by comparing the colony density of the *Streptococcus mutans* of the incubated slide against a visual standard comparison of *Streptococcus mutans* colony density thereby providing for the quantitative determination of *Streptococcus mutans* in the test sample.

4,692,408

FERMENTATION PROCESS FOR THE PRODUCTION OF POLYSACCHARIDES

Geoffrey T. Banks, Horsham, and Paul D. Browning, Orpington, both of United Kingdom, assignors to Imperial Biotechnology Limited, London, England

Filed Nov. 29, 1983, Ser. No. 556,020

Claims priority, application United Kingdom, Nov. 30, 1982, 8234111

Int. Cl.[4] C12P *19/08, 19/04;* C12Q *3/00;* C12N *1/38;* C12R *1/64*

U.S. Cl. 435—104 **8 Claims**

1. A method for the synthesis of polysaccharides comprising culturing polysaccharide-producing microorganisms in a nutrient containing medium, in a first stage involving an increase in the number of microorganisms in said medium by multiplication of said microorganisms, and a second stage in which polysaccharide is synthesized by said microorganisms, said first stage comprising adding carbohydrate capable of supporting polysaccharide biosynthesis to said medium at an exponentially increasing rate, or by using, as sole carbon source, a predetermined quantity of a carbohydrate which does not support polysaccharide biosynthesis, and said second stage being conducted in the absence of at least one nutrient essential for growth of the microorganism.

4,692,409

METHOD FOR PRODUCING L-ASPARTIC ACID

Masahiko Kisumi, Kobe; Saburo Komatsubara, Kusatsu, and Tomoyasu Taniguchi, Izumiohtsu, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed May 30, 1984, Ser. No. 615,290

Claims priority, application Japan, Jun. 15, 1983, 58-107573

Int. Cl.[4] C12P *13/20;* C12N *15/00, 1/20, 1/00*

U.S. Cl. 435—109 **3 Claims**

1. *Escherichia coli* TA-5004 (FERM BP-532).

4,692,410

INFECTIONS BRONCHITIS VIRUS STRAINS

Peter Apontoweil, Leersum, and Manfred M. Krasselt, De Bilt, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 409,996, Aug. 20, 1982, Pat. No. 4,481,188. This application Jun. 15, 1984, Ser. No. 621,077

Claims priority, application European Pat. Off., Aug. 28, 1981, 81-200960.3

Int. Cl.[4] A61K *39/215*

U.S. Cl. 435—235 **2 Claims**

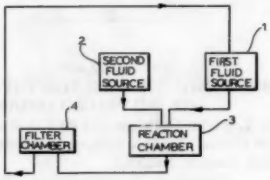
1. Infectious bronchitis virus strains of a novel serotype of the virus strain identified by means of the internal notation Gelderland.901 deposited at the Czechoslovak National Collection of Type Cultures of the Institute of Hygiene and Epidemiology in Prague under No. CNCTC AO 17/81 and deposited at the Collection Nationale de Cultures de Micro organismes d'Institute Pasteur, Paris, under No. I-168.

4,692,411

SEPARATION OF SPECIFIC BIOLOGICAL CELLS BY A BIOCHEMICAL FILTER

Rabindra N. Ghose, 8167 Mulholland Ter., Los Angeles, Calif. 90046

Filed Sep. 6, 1983, Ser. No. 529,347
Int. Cl.[4] C12N *1/00, 1/02;* A01N *1/02;* C12Q *1/24*
U.S. Cl. 435—243 28 Claims



1. A biochemical filter system comprising;

(a) a chamber containing specific biological cells to be separated in a fluid mixture of these cells, other biological cells and particulates;

(b) a complementary source storage chamber containing corresponding complementary agglutinins which can react specifically with the biological cells to be separated to form clumps;

(c) a reaction chamber, where specific reaction occurs, leading to the formation of clumps, said chamber having first and second inlets and and outlet;

(d) means for connecting said chamber containing said biological cells to be separated to the first inlet of the reaction chamber and for introducing said specific biological cells into said reaction chamber;

(e) means for connecting said chamber containing complementary agglutinins to the second inlet of the reaction chamber and for introducing said complementary agglutinins into said reaction chamber;

(f) filter means coupled to said outlet of said reaction chamber for filtering the fluid containing the clumps and other cells and particulates following the reaction in the reaction chamber so as to retain the clumps as filter residue;

(g) means for introducing the fluid containing the clumps and other cells and particulates following reaction in the reaction chamber into said filter means; and

(h) means for returning the fluid filtrate following filtering to the chamber containing said biological cells.

4,692,412

METHOD OF PREPARING AN AUTOGENOUS VACCINE

Virginia W. Livingston, 8492 Prestwick Dr., LaJolla, Calif. 92037; Eleanor G. Alexander-Jackson, 390 Riverside Dr., New York, N.Y. 10025, and Afton M. Livingston, 8492 Prestwick Dr., LaJolla, Calif. 92037

Continuation of Ser. No. 569,253, Jan. 9, 1984, abandoned, which is a continuation of Ser. No. 171,543, Jul. 23, 1980, abandoned, which is a continuation of Ser. No. 955,878, Oct. 30, 1978, abandoned, which is a continuation of Ser. No. 776,360, Mar. 10, 1977, abandoned, which is a continuation of Ser. No. 672,965, Apr. 2, 1976, abandoned, which is a continuation of Ser. No. 295,720, Oct. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 82,806, Oct. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 831,985, Jun. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 490,629, Sep. 27, 1965, abandoned. This application Mar. 11, 1986, Ser. No. 839,457
Int. Cl.[4] C12N *1/20;* A61K *39/085*
U.S. Cl. 435—253 5 Claims

1. A method of preparing an autogenous vaccine for immunization against neoplastic diseases characterized by the presence of a *Progenitor cryptocides* organism identified by ATCC 31,874, which comprises:

(a) admixing a sterile blood sample containing *Progenitor cryptocides* with sterile distilled water;

(b) incubating the admixture;

(c) killing or inactivating the *Progenitor crytocides* in the admixture;

(d) microfiltering the admixture to remove blood cells, and

(e) diluting the filtrate containing the attenuated *Progenitor cryptocides* with a sterile saline solution, thereby forming autogenous vaccine.

4,692,413

USE OF RLDM TM 1–6 AND OTHER LIGNINOLYTIC ENZYMES FOR THE DECOLORIZATION OF E1 EFFLUENT

Roberta L. Farrell, Danvers, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 755,245, Jul. 15, 1985, abandoned. This application Mar. 28, 1986, Ser. No. 845,657
Int. Cl.[4] D21C *3/00, 3/20;* C12R *1/645;* C02F *3/00*
U.S. Cl. 435—278 18 Claims

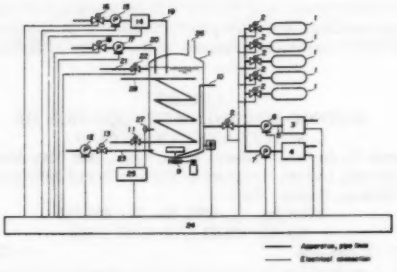
1. A process for decolorizing E1 effluent which comprises treating said effluent with the Ligninolytic Mixture TM from a *Phanerochaete chrysosporium* fermentation consisting essentially of rLDM TM 1 through 6, and other ligninolytic enzymes.

4,692,414

APPARATUS FOR AUTOMATICALLY CONTROLLING THE FEED RATE OF ALCOHOL SOLUTION AS RAW MATERIAL IN A VINEGAR PRODUCTION PROCESS

Mikio Yamada; Yoshinori Tsukamoto, and Masahiro Mizuno, all of Handa, Japan, assignors to Nakano Vinegar Co., Ltd., Aichi, Japan

Division of Ser. No. 722,783, Apr. 12, 1985, Pat. No. 4,654,215. This application Dec. 4, 1986, Ser. No. 938,166
Claims priority, application Japan, Apr. 23, 1984, 59-80306
Int. Cl.[4] C12M *1/34*
U.S. Cl. 435—291 9 Claims



1. In apparatus for automatically controlling the feed rate of an alcohol solution as raw material in a process for producing vinegar from a fermenting broth in a fermentation tank, the improvement comprising:

an automatic alcohol analyzer for measuring the alcohol concentration in said fermenting broth in said fermentation tank;

feeding means for feeding alcohol solution as raw material to said fermentation tank;

control computer means coupled to said analyzer and to said feeding means for energizing said alcohol analyzer to initiate an automatic alcohol concentration measurement and for receiving an output signal from said analyzer corresponding to the measured alcohol concentration, said control computer means including calculating means

for calculating a feed rate of alcohol solution as raw material to said fermenting broth responsive to said output from said alcohol analyzer, and for generating an output signal responsive to said calculations to control operation of said feeding means to feed alcohol solution as raw material to said fermenting broth so as to control the alcohol concentration in said fermenting broth at a desirable concentration, said control computer means including means for periodically causing said analyzer to measure said alcohol concentration in said fermenting broth at given intervals over a plurality of cycles of measurement.

4,692,415

PROCESS FOR THE DETERMINATION OF CYANAMIDE IN PLANTS AND PLANT PARTS

Ulrich Rust, Trostberg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Aug. 14, 1986, Ser. No. 896,950

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530013; Jul. 25, 1986, 3625205

Int. Cl.[4] G01N *33/00, 33/02*

U.S. Cl. 436—20 **21 Claims**

1. A process for the determination of cyanamide in plants or plant parts, comprising

(a) extracting cyanamide from plants or plant parts,

(b) reacting the cyanamide in aqueous alkaline medium with 1,2-naphthoquinone-4-sulphonate to give 4-cyanimido-1, 2-naphthoquinone,

(c) separating the 4-cyanamido-1,2-naphthoquinone from the aqueous medium by high performance liquid chromatography on a reverse phase and

(d) determining the 4-cyanimido-1, 2-naphthoquinone spectrophotometrically at a wavelength of 485 nm or 272 nm as a measure of the cyanamide extracted from the plants or plant parts.

4,692,416

MONOCLONAL ANTIBODIES REACTIVE WITH SHARED IDIOTYPES ON HUMAN ANTIBODIES TO NATIVE DNA FROM PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

Betty A. Diamond, New York, N.Y., assignor to Yeshiva University, Bronx, N.Y.

Continuation-in-part of Ser. No. 446,718, Dec. 3, 1982, abandoned. This application Nov. 16, 1983, Ser. No. 552,290

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] G01N *33/564, 33/577*

U.S. Cl. 436—508 **30 Claims**

1. Monoclonal antibodies capable of reacting with a shared idiotype on human anti-native DNA antibody, said idiotype shared between genetically nonidentical individuals.

4,692,417

IMMUNOLOGICAL IDENTIFICATION TEST FOR GROUP D STREPTOCOCCI USING ACHROMOPEPTIDASE

Martyn F. Webster, Basingstoke, England, assignor to Oxoid Limited, Hampshire, England

Filed May 30, 1985, Ser. No. 739,462

Claims priority, application United Kingdom, Jun. 5, 1984, 8414273

Int. Cl.[4] G01N *33/53;* **C12Q** *1/38, 1/14*

U.S. Cl. 436—518 **18 Claims**

1. An immunological agglutination test method for identifying Lancefield group D streptococcus, which comprises treating a sample suspected of containing group D streptococcus with achromopeptidase, contacting the sample with antibody specific for Lancefield group D streptococcal antigen to form a mixture, said antibody being bound to minute, insoluble carrier particles and examining the mixture for agglutination as an indication of the presence of Lancefield Group D streptococci.

4,692,418

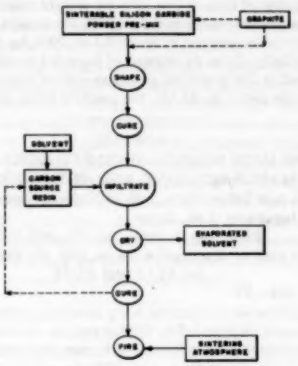
SINTERED SILICON CARBIDE/CARBON COMPOSITE CERAMIC BODY HAVING FINE MICROSTRUCTURE

Wolfgang D. G. Boecker, and George I. Reini, both of Lewiston, N.Y., assignors to STEMCOR Corporation, Cleveland, Ohio

Continuation of Ser. No. 645,462, Aug. 29, 1984, abandoned. This application Feb. 19, 1987, Ser. No. 16,459

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—90 **19 Claims**



1. A process for producing a sintered silicon carbide/carbon composite ceramic body consisting essentially of:

a. forming a homogeneous mixture comprising the components of:

(1) a carbon-containing additive selected from the group consisting of amorphous carbon, and a solvent soluble, organic material which can be coked at temperatures below about 1000° C. to form amorphous carbon or mixtures thereof, in an amount between 0.5 and 5 percent by weight of uncombined carbon;

(2) from about 0.15 to about 15 percent by weight of a sintering aid selected from the group consisting of aluminum, beryllium or boron or compounds containing any one or more of these elements or a mixture of any of the foregoing elements or compounds, said sintering aid containing from about 0.15 to about 5 percent by weight of aluminum, boron or beryllium or a mixture of any of these elements;

(3) up to about 25 percent by weight of organic temporary binder;

(4) a balance of silicon carbide powder having a surface area of from about 5 to about 100 square meters per gram;

b. shaping the mixture in such a way as to produce a microporous shaped object having a density of at least about 45 percent of theoretical; and

c. infiltrating the shaped object with a sufficient amount of an organic material which can be coked at temperatures below sintering temperature to form amorphous carbon, in an amount between about 1 and 25 percent by weight of the shaped object;

d. firing the infiltrated object in the absence of any substantial externally applied pressure under such conditions of time and temperature in an atmosphere inert to silicon carbide or in a vacuum at a temperature of between about 1900° C. and 2300° C. until a sintered body having a homogeneous microstructure of silicon grains having a maximum size of about 5 microns, said microstructure having

carbon substantially uniformly dispersed throughout, is formed.

4,692,419

SILICON NITRIDE SINTERED BODY AND MANUFACTURING METHOD THEREOF

Minoru Matsui, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 892,249
Claims priority, application Japan, Sep. 17, 1985, 60-204986
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—97 **8 Claims**

1. A silicon nitride sintered body consisting essentially of Sr in an amount of from 0.1 to 18% by weight calculated as SrO, Mg in an amount of from 0.2 to 25% by weight calculated as MgO, Ce in an amount of from 0.1 to 20% by weight calculated as CeO_2, Zr in an amount of from 0.1 to 15% by weight calculated as ZrO_2 and Al in an amount of from 1 to 20% by weight calculated as Al_2O_3, the balance being silicon nitride.

4,692,420

SILICON NITRIDE SINTERED BODY AND MANUFACTURING METHOD THEREOF

Isao Oda, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 892,362
Claims priority, application Japan, Sep. 17, 1985, 60-204985
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—97 **6 Claims**

1. A silicon nitride sintered body consisting essentially of Mg in an amount of from 0.5 to 5% by weight calculated as MgO, Sr in an amount of from 0.5 to 5% by weight calculated as SrO, Ce in an amount of from 1 to 10% by weight calculated as CeO_2 and Al in an amount of from 1 to 20% by weight calculated as Al_2O_3, the balance being silicon nitride.

4,692,421

DIELECTRIC CERAMICS

Kazutoshi Matsumoto, Matsudo; Tetsuro Nakamura, Yokohama; Takehiro Hyuga, Ichikawa, and Hiroshi Ichimura, Matsudo, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,569
Claims priority, application Japan, Feb. 27, 1985, 35-38515
Int. Cl.[4] C04B *35/02*
U.S. Cl. 501—136 **3 Claims**

1. Dielectric ceramics which substantially have a K_2NiF_4-type crystal structure and which display an unloaded Q value of 6000 or greater, said dielecrtic ceramics having the formula:

$$aSrO.bCaO.cTiO_2.dSnO_2$$

wherein $0.39 \leqq a \leqq 0.70$, $0 \leqq b \leqq 0.28$, $0.27 \leqq c \leqq 0.35$, $0 \leqq d \leqq 0.04$, $0.65 \leqq a+b \leqq 0.70$, and $a+b+c+d=1$.

4,692,422

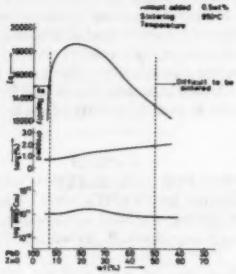
HIGH DIELECTRIC PORCELAIN COMPOSITION AND METHOD OF REDUCING SINTERING TEMPERATURE THEREOF

Shinobu Fujiwara; Atsushi Satoh; Tetsuya Hattori, and Junichi Sutoh, all of Tokyo, Japan, assignors to TDK Corporation, Japan

Filed May 2, 1986, Ser. No. 858,945
Claims priority, application Japan, May 2, 1985, 60-93741
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—136 **10 Claims**

1. High dielectric porcelain composition consisting essentially of a $Pb(Mg\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ - $PbTiO_3$- $Pb(Mn\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ system having about 95 mol. % of $Pb(Mg\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$, about 5 mol. % of $PbTiO_3$, about 0.5 weight % of $Pb(Mn\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$, and having distributed therethrough, in addition, a sintering temperature lowering effective amount of PbO and ZnO,

wherein said sintering temperature lowering effective amount of said PbO and ZnO is between about 0.25–1.25% by weight of the weight of said $Pb(Mg\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ - $PbTiO_3$ - $Pb(Mn\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ system, and



wherein said sintering temperature lowering effective amount includes about 50–93% by weight of said PbO and about 7–50% by weight of said ZnO.

4,692,423

METHOD FOR PREPARING STRUCTURED CATALYTIC SOLIDS

Philip D. Caesar, St. John, British Virgin Isls., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1985, Ser. No. 804,552
Int. Cl.[4] B01J *29/06, 27/20*
U.S. Cl. 502—62 **28 Claims**

1. A method for manufacturing a structured catalytic solid comprising a zeolite and a porous support, said zeolite being uniformly distributed on a surface of said porous support, which comprises admixing said zeolite with an organic polymerizable cyclic oxide solvent under polymerizing conditions thereby forming a fluid sol comprising a polymerized organic component and reactively deflocculated zeolite, contacting said sol with said surface of said porous support thereby coating said surface, and substantially removing residual solvent and said polymerized organic component from the coated surface, provided that where said porous support is an inorganic oxide, the particle size of said support ranges from about 20 μ to 1 inch.

8. The method described in claim 1 wherein said porous support comprises carbon.

10. The method described in claim 1 wherein said organic polymerizable cyclic oxide solvent is selected from the group consisting of tetrahydrofuran, 1,2-epoxycyclohexane and 1,2-epoxypropane.

14. The method described in claim 1 wherein said zeolite contains 0.01 to 10 wt. % of a platinum-group metal.

4,692,424

DRY IMPREGNATED MANGANESE ZEOLITE

Raymond Le Van Mao, Montreal, Canada, assignor to The Asbestos Institute, Montreal, Canada

Continuation-in-part of Ser. No. 688,639, Jan. 3, 1985, Pat. No. 4,615,995. This application Jun. 17, 1986, Ser. No. 875,191
Int. Cl.[4] B01J *29/28, 21/16*
U.S. Cl. 502—68 **2 Claims**

1. A process for the dry incorporation of manganese ions on the external reactive sites of Zn-ZSM-5 or Zn-ZSM-11 pentasil which comprises mixing a Zn-ZSM-5 or Zn-ZSM-11 zeolite with bentonite, impregnating the dry mixture with a minimum amount of a solution of a manganese salt thereby to form a malleable paste and extruding said paste under pressure whereby the manganese ions are affixed to the surface reactive sites of the treated zeolite.

4,692,425

CATALYST FOR REDUCING THE NITROGEN OXIDE CONTENT OF FLUE GASES

Michael Schneider, Ottobrunn-Riemerling; Karl Kochloefl, Moosburg; Gerd Maletz, Landshut, and Hans J. Wernicke, Geretsried, all of Fed. Rep. of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,168

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524160

Int. Cl.[4] B01J *20/12*

U.S. Cl. 502—81 18 Claims

1. A catalyst, active for the reduction of NO_x in flue gases, which comprises an acid-activated, three layer silicate, in which the three layered structure is substantially intact after acid activation.

2. A catalyst, as defined in claim 1, in which said multilayer silicate has a cation exchange capacity of ≧30 mVal/100 g before acid activation.

3. A catalyst, as defined in claim 1, in which the acid activation of said layer silicate has increased the BET surface area by at least 15%, as compared to the BET surface area of said layer silicate prior to acid activation.

7. A catalyst, as defined in claim 1, in which the acid-activated layer silicate is a smectite.

4,692,426

PHOSPHITE-PROMOTED RUTHENIUM-COBALT CATALYSTS FOR THE DEALKOXYHYDROXYMETHYLATION OF ACETALS TO FORM GLYCOL ETHERS

D. Michael Duggan, Drexel Hill; James E. Lyons, Wallingford, and Harry K. Myers, Jr., Cochranville, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,971, Oct. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 623,059, Jun. 21, 1984, abandoned. This application Aug. 29, 1986, Ser. No. 901,861

Int. Cl.[4] B01J *31/20*

U.S. Cl. 502—154 24 Claims

1. Composition consisting essentially of

(a) an organophosphite of the formula

$$P(OR')_3$$

wherein each of the R' groups, which may be the same or different, is hydrogen, alkyl, cycloakyl, or aryl; and

(b) a ruthenium-cobalt carbonyl compound or mixture of ruthenium carbonyl and cobalt carbonyl compounds selected from the group consisting of:

(1) a mixture of $Co_2(CO)_8$ and $Ru_3(CO)_{12}$;

(2) $Co_2Ru(CO)_{11}$; and

(3) a mixture of $R^5CCo_3(CO)_9$ and $Ru_3(CO)_{12}$,

wherein R^5 is hydrogen; alkyl; cycloalkyl or alkyl-substituted cycloalkyl; alkoxy; aryl or alkyl-, cyclo-alkyl-, alkoxy-, halo-, or cyano-substituted aryl; or a silyl moiety of the formula $R_3{}^6Si$, wherein R^6 is alkyl or aryl.

4,692,427

DISPERSIONS AND THE PREPARATION OF FOAMED RESINS THEREFROM

Ronald L. Pastorino, San Anselmo, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Witco Corporation, Richmond, Calif.

Filed Nov. 25, 1986, Ser. No. 934,734

Int. Cl.[4] C08J *9/08*

U.S. Cl. 502—160 14 Claims

1. An aqueous dispersion for use in foaming and curing polyester resins comprising a symmetrical or asymmetrical aromatic diacyl peroxide; an alkali metal carbonate or bicarbonate or mixtures thereof; a dispersion stabilizing amount of magnesium aluminum silicate and alkali metal carboxymethyl cellulose; and sufficient water to form an aqueous dispersion.

4,692,428

PREPARATION AND USE OF CATALYSTS COMPRISING MIXTURES OF TUNGSTEN OXIDE AND SILICA ON ALUMINA

Lawrence L. Murrell, South Plainfield; Nicholas C. Dispenziere, Jr., Wall, and Richard S. Polizzotti, Milford, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 31, 1985, Ser. No. 815,201

Int. Cl.[4] B01J *23/30, 21/12*

U.S. Cl. 502—254 12 Claims

1. As a composition of matter, a compound prepared by (i) forming a composite of a mixture of (a) tungsten-containing particles selected from the group consisting of tungsten oxide, tungstic acid, tungsten compounds capable of being converted to tungsten oxide when treated with steam, and mixtures thereof, (b) silicon-containing particles selected from the group consisting of silica, silicic acid and silicon compounds insoluble in polar and non-polar solvents and which are capable of being converted to silica when treated with steam in a non-reducing atmosphere and (c) particles of porous alumina, and (ii) steaming said composite at an elevated temperature of at least about 500° C. in a non-reducing environment and in the presence of steam for a time sufficient for at least a portion of the tungsten oxide and silica to react with the alumina surface.

4,692,429

CATALYST COMPOSITION AND MULTI-FUNCTIONAL SENSOR

Satoshi Sekido, Yawata; Hirokazu Tachibana, Kyoto, and Yasuharu Yamamura, Katano, all of Japan, assignors to Research Association of Electric Conductive Inorganic Compounds, Tokyo, Japan

PCT No. PCT/JP85/00163, § 371 Date Dec. 23, 1985, § 102(e) Date Dec. 23, 1985, PCT Pub. No. WO85/04859, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 3, 1985, Ser. No. 826,495

Claims priority, application Japan, Apr. 25, 1984, 59-84353; May 30, 1984, 59-109812; Jul. 6, 1984, 59-140878

Int. Cl.[4] B01J *23/10, 23/58, 23/78*

U.S. Cl. 502—303 14 Claims

1. A composition comprising a mixture of $Sr_{(1+x)/2}La_{(1-x)/2}Co_{1-x}Me_xO_{3-\delta}$ wherein $0 \leqq x \leqq 1$; δ represents loss of oxygen, and Me is at least one of Fe, Mn, Cr and V;

$SrMeO_3$, wherein Me is at least one of Ti, Zr and Hf; and at least one Pt group metal.

4,692,430

ZINC ALUMINATE DOUBLE BOND ISOMERIZATION CATALYST AND PROCESS FOR ITS PRODUCTION

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 745,556, Jun. 17, 1985, Pat. No. 4,620,053. This application Jun. 30, 1986, Ser. No. 880,266

Int. Cl.[4] B01J *21/04, 23/06*

U.S. Cl. 502—342 8 Claims

1. A process for preparing an activated double bond isomerization catalyst, said process comprising the steps of:

calcining a composition which essentially consists of zinc aluminate in an oxygen containing atmosphere at a temperature of about 250° C. to about 800° C. for a time of about 1 hour to about 30 hours;

contacting the thus calcined composition with a reducing gas selected from the group consisting of carbon monoxide and nitric oxide at a temperature of about 400° C. to about 750° C. for a time of about 1 minute to about 30 hours.

4,692,431
HYDROUS OXIDE ACTIVATED CHARCOAL

Joseph P. Weller, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 16, 1985, Ser. No. 809,441
Int. Cl.[4] B01J *20/20, 20/10, 20/08;* **B01D** *15/04*
U.S. Cl. 502—417 **15 Claims**

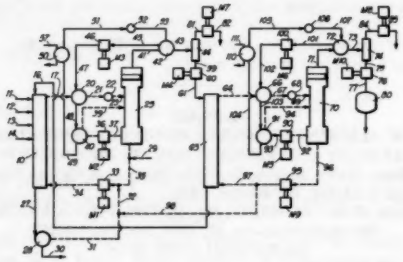
1. A process for preparing of an ion exchanger, comprising:
treating an ionically inert activated charcoal porous support with an aqueous solution of metal oxychloride selected from the group consisting of zirconium and titanium oxychlorides so as to impregnate the pores of said support with said solution;
separating said treated support from excess metal oxychloride solution;
converting said metal oxychloride to a hydrous metal oxide precipitate in the pores of said support at a pH above 8 and above the pH whereat the hydrous metal oxide and activated charcoal support have opposite zeta potentials and sufficient to hydrolyze said metal oxychloride.

13. A process for preparing an ion exchanger comprising:
treating granulated activated charcoal with a concentrated solution of a metal oxychloride from the group consisting of zirconium and titanium oxychlorides.
degassing said mixture; and
treating the resultant mixture with a base selected from the group consisting of ammonium hydroxide and alkali metal hydroxides so as to precipitate said oxychloride within the pores of said activated carbon granules as hydrous metal oxide at a pH above 8 and above the pH whereat the hydrous metal oxide and activated charcoal have opposite zeta potentials.

4,692,432
TWO CYCLE PROCESS FOR PRODUCING FUEL-GRADE ETHANOL FROM DILUTE AQUEOUS MIXTURES

Daniel W. Tedder, Marietta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 534,262, Sep. 21, 1983, Pat. No. 4,517,298, which is a continuation of Ser. No. 265,328, May 18, 1981, abandoned, and a continuation-in-part of Ser. No. 544,813, Oct. 10, 1983, Pat. No. 4,510,242, which is a continuation of Ser. No. 283,739, Jul. 15, 1981, abandoned. This application Aug. 12, 1985, Ser. No. 764,390
Int. Cl.[4] C07C *29/86, 31/08*
U.S. Cl. 568—916 **17 Claims**



1. A process of producing alcohol comprising feeding a dilute aqueous mixture containing said alcohol to a first solvent extraction column, feeding an organic solvent for said alcohol, which solvent is essentially immiscible with water, to said first extraction column for admixing with said aqueous mixture containing said alcohol, to dissolve the alcohol therefrom for forming an alcohol-organic solvent extract phase containing residual amounts of water, and a raffinate containing water and residual amounts of entrained solvent, alcohol and solids, separating said alcohol-organic solvent phase from said raffinate, vacuum stripping the water and alcohol from said extract phase, condensing the vacuum stripped water and alcohol and passing said alcohol-water to a second solvent extraction column serving as a drying column to obtain a second alcohol-organic solvent extract phase being relatively water free, separating the entrained solvent from said raffinate and returning said entrained solvent to said first solvent extraction column, passing the second alcohol-solvent extract phase from said second solvent extraction column to a vacuum stripper for separating the alcohol from the organic solvent and returning the organic solvent to said second solvent extraction column.

4,692,433
METHOD AND COMPOSITION FOR REGULATING SERUM CALCIUM LEVELS OF MAMMALS

Karl Y. Hostetler, and Leonard J. Deftos, both of Del Mar, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 541,125, Oct. 12, 1983, abandoned. This application Aug. 1, 1985, Ser. No. 761,751
Int. Cl.[4] A61K *31/245, 9/42, 37/30, 37/24*
U.S. Cl. 514—12 **22 Claims**

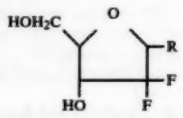
1. A method for regulating blood calcium levels in a mammal which comprises: orally administering to said mammal a blood calcium-regulating effective amount of a composition consisting essentially of an aqueous solution of a polypeptide hormone selected from the group consisting of parathyroid hormone and calcitonin, said polypeptide hormone being encapsulated in a liposome.

4,692,434
DIFLUORO ANTIVIRALS AND INTERMEDIATE THEREFOR

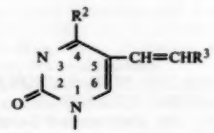
Larry W. Hertel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 473,883, Mar. 10, 1983, Pat. No. 4,526,988. This application Dec. 4, 1984, Ser. No. 677,146
Int. Cl.[4] A61K *31/70;* **C07H** *17/00*
U.S. Cl. 514—49 **4 Claims**

1. A nucleoside of the formula



wherein R is a base of the formula



wherein

R^2 is amino;

R^3 is hydrogen, bromo, chloro or iodo.

3. A method of treating Herpes viral infections in mammals comprising administering to a mammal in need of such treatment an anti-Herpes viral effective amount of a compound of claim 1.

4,692,435

MUCOPOLYSACCHARIDE COMPOSITION HAVING A REGULATORY ACTION ON COAGULATION, MEDICAMENT CONTAINING SAME AND PROCESS OF PREPARATION

Jean-Claude Lormeau, Maromme-la-Maine; Jean Goulay, Oissel, and Jean Choay, Paris, all of France, assignors to Choay, S.A., Paris, France

Continuation of Ser. No. 204,505, Nov. 5, 1980, abandoned. This application Apr. 23, 1985, Ser. No. 726,178

Claims priority, application France, Nov. 6, 1978, 78 31357; Jul. 20, 1979, 79 18873

The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.[4] A61K *31/725*; C08B *37/10*

U.S. Cl. 514—56 48 Claims

33. A therapeutic composition which presents less risks than heparin of blood hypercoagulation and of a host hemorrhaging, which composition has improved antithrombotic activity (anti-X_a activity) and improved selectivity with respect to anti-X_a activity than heparin in vivo and a lower and slower anticoagulation activity than heparin, and which composition comprises a therapeutically acceptable carrier and an antithrombotic effective amount of heparinic mucopolysaccharide fractions having constituents of a molecular weight not in excess of about 10,000 daltons, which fractions have (1) a mixture of lower molecular weight fractions in the range of about 2,000 to about 4,000 daltons with higher molecular weight fractions of a molecular weight in the range of about 4,000 to about 10,000 daltons, (2) a Yin-Wessler of at least 40, and (3) a ratio of Yin-Wessler to USP titer in the range of 3 to 5, which mixture of fractions have improved antithrombotic activity in vivo which is higher than that of heparin and a whole anticoagulation activity lower than that of heparin, and the physiologically acceptable salts thereof.

4,692,436

PHOSPHOROIMIDATES AS PESTICIDES

Toyohiko Kume; Shinichi Tsuboi, and Kunihiro Isono, all of Hino, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

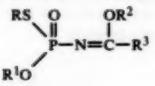
Filed May 9, 1986, Ser. No. 861,471

Claims priority, application Japan, May 14, 1985, 60-100607

Int. Cl.[4] A01N *57/02*; C07F *9/24*

U.S. Cl. 514—129 10 Claims

1. A phosphoroimidate of the formula



wherein

R represents n-propyl or sec.-butyl,

R^1 represents methyl or ethyl,

R^2 represents methyl or ethyl, and

R^3 represents alkyl having from 3 to 4 carbon atoms.

9. A method of combating insects, acarids or nematodes which comprises applying thereto or to a habitat thereof an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim 1.

4,692,437

ANTI-HYPERTENSIVE AGENTS

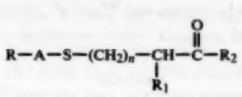
James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation-in-part of Ser. No. 116,951, Jan. 30, 1980, abandoned, Ser. No. 116,950, Jan. 30, 1980, Ser. No. 64,897, Aug. 14, 1979, Ser. No. 64,898, Aug. 14, 1979, Ser. No. 64,899, Aug. 14, 1979, Ser. No. 64,900, Aug. 14, 1979, Ser. No. 64,901, Aug. 14, 1979, Ser. No. 64,902, Aug. 14, 1979, and Ser. No. 64,903, Aug. 14, 1979, said Ser. No. 116,950, is a continuation of Ser. No. 941,289, Sep. 11, 1978, abandoned. This application Jun. 5, 1980, Ser. No. 156,749

Int. Cl.[4] A61K *31/425, 31/40*; C07D *207/00, 277/04*

U.S. Cl. 514—165 8 Claims

1. A new compound comprising physiologically acceptable salts of compounds having the formula



wherein

R is hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonyl-L-lysyl, pyro-L-glutamyl-L-lysyl, L-lysyl, L-arginyl or pyro-L-glutamyl;

A is phenylalanyl, glycyl, alanyl, tryptophyl, tyrosyl, isoleucyl, leucyl, histidyl or valyl, the α-amino group thereof being in amide linkage with R unless R is hydrogen;

R_1 is hydrogen or methyl;

R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline, L-thiazolidine-4-carboxylic acid, or L-5-oxo-proline, the imino group thereof being in imide linkage with the adjacent

and,

n is 0 or 1, such that when n is 0, R_1 is methyl.

4,692,438

PYRIDAZO-DIAZEPINES, DIAZOCINES, AND -TRIAZEPINES HAVING ANTI-HYPERTENSIVE ACTIVITY

Cedric H. Hassall, Harpenden; Geoffrey Lawton, Hitchin, and Sally Redshaw, Stevenage, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

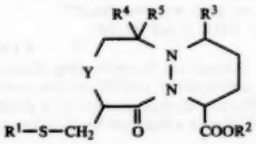
Filed Aug. 12, 1985, Ser. No. 764,372

Claims priority, application United Kingdom, Aug. 24, 1984, 8421493; May 29, 1985, 8513541

Int. Cl.[4] A61K *31/50*; C07D *245/00, 487/06, 237/02*

U.S. Cl. 514—183 18 Claims

1. A diastereomeric compound of the formula



I

wherein R^1 is hydrogen, alkanoyl of up to 8 carbon atoms, benzoyl, or benzoyl substituted by one substituent selected from the group consisting of halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms and trifluoro-

methyl; R^2 is hydrogen or alkyl of 1 to 8 carbon atoms; R^3 is hydrogen, phenyl or phenyl substituted by one substituent selected form the group consisting of halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms and trifluoromethyl; R^4 and R^5 each are hydrogen or R^4 and R^5 taken together are oxo; and Y is $—CH_2—$, $—CH_2CH_2—$ or $—N(R^6)—$ in which R^6 is hydrogen, alkyl of 1 to 8 carbon atoms or alkyl of 1 to 8 carbon atoms bearing a phenyl or a phenyl substituted by one substituent selected from the group consisting of halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms and trifluoromethyl,

its diastereomeric racemate or mixtures thereof, as well as a pharmaceutically acceptable salt thereof with a base when R^2 is hydrogen, or a pharmaceutically acceptable salt thereof with an acid when Y is $—N(R^6)—$.

6. A compound, in accordance with claim 1, wherein R^1, R^2 and R^3 each are hydrogen, and R^4 and R^5 taken together are oxo.

4,692,439
THERAPEUTIC USE OF TIN DIIODODEUTEROPORPHYRIN

Darryl Rideout, Del Mar, Calif.; Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, N.Y.

Division of Ser. No. 876,921, Jun. 20, 1986, Pat. No. 4,668,670. This application Jan. 29, 1987, Ser. No. 8,869

Int. Cl.[4] A61K *31/555*

U.S. Cl. 514—185 **1 Claim**

1. A method of increasing the rate of tryptophan metabolism in the liver of humans in need of such increase which comprises parenteral administration of an amount of tin diiododueteroporphyrin which is effective to increase such rate.

4,692,440
THERAPEUTIC USE OF TIN MESOPORPHYRIN

Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 715,515, Mar. 25, 1985, Pat. No. 4,657,902. This application Oct. 24, 1986, Ser. No. 922,699

Int. Cl.[4] A61K *31/555*

U.S. Cl. 514—185 **10 Claims**

1. A method of increasing the rate at which heme is excreted by a mammal in need of such increased disposal of heme, which comprises parenteral administration of an amount of the tin mesoporphyrin which is sufficient to effect such increase.

10. A method of increasing the rate of tryptophan metabolism in the liver of humans in need of such increase which comprises parenteral administration of an amount of tin mesoporphyrin which is effective to increase such rate.

4,692,441
CHORINE ESTERS AS ABSORPTION-ENHANCING AGENTS FOR DRUG DELIVERY THROUGH MUCOUS MEMBRANES OF THE NASAL, BUCCAL, SUBLINGUAL AND VAGINAL CAVITIES

Jose Alexander; A. J. Repta, and Joseph A. Fix, all of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 16, 1985, Ser. No. 766,377

Int. Cl.[4] A61K *31/43, 31/545*

U.S. Cl. 514—194 **8 Claims**

1. A pharmaceutical composition for enhancing absorption from the nasal, buccal, sublingual or vaginal cavities comprising a therapeutically effective dosage amount of a β-lactam antibiotic drug and choline ester a absorption enhancing agent of the formula:

$$[(CH_3)_3N^+CH_2CH_2OR]X^-$$

wherein R is saturated acyl (C_2–C_{20}), acyl (C_2–C_{20}) with 1 to 6 double bonds, hydroxyacyl (C_2–C_{20}) with 1 to 3 hydroxy groups, ketoacyl (C_4–C_{20}), unsaturated hydroxyacyl (C_5–C_{20})-,carboxyacyl (C_4–C_{20}), arylacyl (C_7–C_{20}), alkylaroyl(C_7–C_{20}) or carbalkoxyacyl (C_5–C_{20}) and X is a pharmaceutically acceptable counterion.

4,692,442
6-SUBSTITUTED PENEM COMPOUNDS

Jacques Gosteli, Basel; Ivan Ernest, Birsfelden, both of Switzerland; Marc Lang, Mulhouse, France, and Robert B. Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

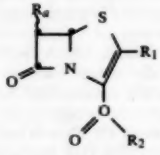
Continuation of Ser. No. 7,453, Jan. 29, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 208,105

Claims priority, application Switzerland, Feb. 2, 1978, 1140/78-3

Int. Cl.[4] C07D *499/00;* **A61K** *31/43*

U.S. Cl. 514—195 **16 Claims**

1. A 2-penem-3-carboxylic acid compound of the formula



(I)

wherein R_a is hydroxy-lower alkyl; R_1 is hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkanoyloxy-lower alkyl, lower alkylthio-lower alkyl, amino lower alkyl, lower alkanoyl-amino-lower alkyl, carboxy-lower alkyl, phenyl; phenyl substituted by lower alkyl, lower alkoxy, hydroxy, halogen, nitro, or by amino; furyl, thienyl, pyridyl; lower alkenylthio or lower alkylthio which is unsubstituted or substituted by lower alkoxy, lower alkanoyloxy, lower alkoxycarbonyl, carbamoyl, cyano, nitro, amino or by amino which is mono or di substituted by (a) lower alkyl or (b) lower alkanoyl; and R_1 is not 2-aminoethylthio; and R_2 is hydroxy; the corresponding compounds in which the functional groups are conventionally protected, or a pharmaceutically acceptable salt thereof.

4,692,443
3-BICYCLICPYRIDINIUM-METHYL CEPHALOSPORINS

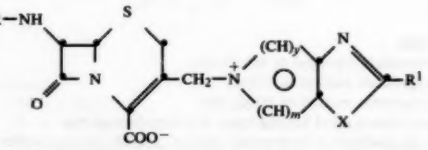
Allen S. Katner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 542,619, Oct. 17, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 679,717

Int. Cl.[4] C07D *501/38;* **A61K** *31/545*

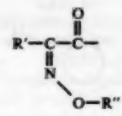
U.S. Cl. 514—206 **59 Claims**

1. A compound of the formula



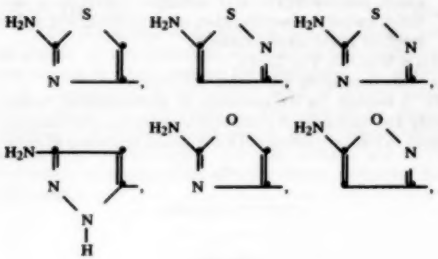
I

wherein R is hydrogen, formyl, α-aminodipoyl, protected α-aminoadipoyl, or an acyl group of the formula

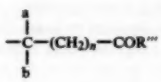


wherein

R′ is 5- or 6-membered heterocyclic ring of the formulas

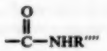


R″ is hydrogen, C_1–C_4 alkyl, a carboxy-substituted alkyl or carboxy-substituted cycloalkyl group of the formula



wherein n is 0–3; a and b when taken separately are independently hydrogen or C_1–C_3 alkyl, and when taken together with the carbon to which they are bonded form a C_3–C_7 carbocyclic ring; R‴ is hydroxy, C_1–C_4 alkoxy, amino, or OR*, wherein R* is indanyl, phthalidyl, or an acyloxymethyl group of the formula —CH_2—O—C(O)—R_2 wherein R_2 is C_1–C_4 alkyl or phenyl; or R* is a carboxy-protecting group;

or R″ is an N-substituted carbamoyl group of the formula



wherein

R⁗ is C_1–C_4 alkyl, phenyl or C_1–C_3 alkyl substituted by phenyl;

y and m independently are integers equal to 0, 1, 2 or 3, provided that y plus m equals 3;

R^1 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, thienyl, amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, hydroxycarbonyl, C_1–C_4 alkoxycarbonyl, or phenyl or phenylcarbonyl in which the phenyl groups may be subsituted by one or two groups selected from C_1–C_4 alkoxy, C_1–C_4 alkyl or C_1–C_4 alkylthio;

X is O or S; and the pharmaceutically acceptable salts and biologically labile esters thereof.

4,692,444

1,4-DIHYDRO[1]BENZOTHIOPYRANO[4,3-c]PYRAZOLE DERIVATIVES, COMPOSITIONS CONTAINING THEM, AND PHARMACOLOGICAL METHODS OF USING THEM

Ikuo Ueda, Uenohigashi; Youichi Shiokawa, Ibaraki; Takashi Manabe, Kawanishi, and Yousuke Katsura, Uenonishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

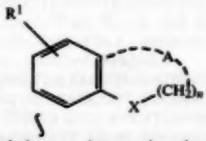
Filed Mar. 5, 1986, Ser. No. 836,402

Claims priority, application United Kingdom, Mar. 26, 1985, 8507782

Int. Cl.⁴ A61K *31/415*; C07D *495/04*

U.S. Cl. 514—406 **17 Claims**

1. A compound of the formula:



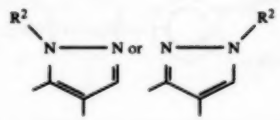
(I)

wherein R^1 is halogen, nitro, amino, hydroxy, lower alkyl, lower alkoxy or acylamino,

X is

n is an integer of 1 or 2 and

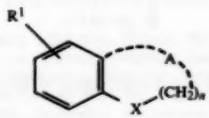
A is a group of the formula:



in which

R^2 is hydrogen, lower alkyl, lower alkynyl, carboxy(lower-)alkyl or protected carboxy(lower)alkyl, or pharmaceutically acceptable salt thereof.

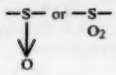
15. A method of treatment of a subject requiring a diuretic agent, uricosuric agent or antihypertensive agent which comprises administering to said subject in need of said treatment an effective amount of compound I, or pharmaceutically acceptable salt thereof, compound I being of the formula:



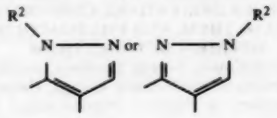
wherein

R^1 is halogen, nitro, amino, hydroxy, lower alkyl, lower alkoxy or acylamino,

x is -S-,



n is an integer of 1 or 2 and
A is a group of the formula:



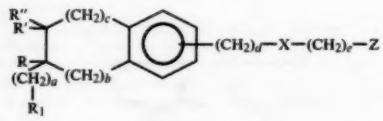
in which
R^2 is hydrogen, lower alkyl, lower alkynyl, carboxy(lower-)alkyl or protected carboxy(lower)alkyl, or pharmaceutically acceptable salt thereof.

4,692,445
BICYCLIC BENZENOID AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND USE

Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

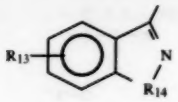
Division of Ser. No. 867,467, May 23, 1986, Pat. No. 4,647,559, which is a continuation-in-part of Ser. No. 798,697, Nov. 1, 1985, Pat. No. 4,639,442, Ser. No. 604,813, Apr. 27, 1984, Pat. No. 4,638,001, and Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This application Nov. 12, 1986, Ser. No. 929,592
Int. Cl.[4] A61K *31/425, 31/535;* **C07D** *275/06, 413/12*
U.S. Cl. 514—212 **19 Claims**

1. A compound of the formula:



wherein:
a is 0, 1 or 2;
b is 0 or 1;
c is b, 1—b, 2—b or 3—b;
d is 0 or 1
e is 2, 3 or 4;
X is oxygen, sulfur,

Z is —NHR_4;
R, R′ and R″ are each independently H, alkyl, or aralkyl;
R_1 is —NR_2R_3;
R_2 and R_3 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;
R_4 is selected for the group consisting of



R_{13} is H, halo, amino, nitro, cyano, hydroxy, lower alkyl, lower alkoxy, lower alkanoyl, cycloloweralkyl, mono- or dilower alkyl amino, lower alkanoyl, lower alkanoyl amino, halololweralkyl, aryl, mercapto, loweralkoxy carbonyl, carboxy, loweralkylthio, loweralkylsulfonyl, sulfamoyl, or lower alkyl sulfamoyl;
R_{14} is SO_2, SO, S or C=O;
or a pharmaceutically acceptable salt thereof.

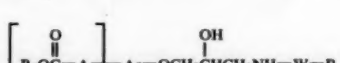
18. A method for the treatment of gastrointestinal hyperacidity and ulceration in a mammal comprising administering thereto an effective amount of a compound according to claim 1.

4,692,446
ESTERS OF ARYLOXYPROPANOLAMINE DERIVATIVES AND MEDICINAL USES

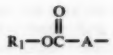
Paul W. Erhardt, Long Valley, N.J., and William L. Matier, Libertyville, Ill., assignors to E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.

Division of Ser. No. 691,787, Jan. 16, 1985, Pat. No. 4,623,652, which is a continuation-in-part of Ser. No. 580,295, Feb. 21, 1984, abandoned, which is a continuation of Ser. No. 320,772, Jan. 12, 1981, abandoned. This application Oct. 28, 1986, Ser. No. 923,993
Int. Cl.[4] A61K *31/535;* **C07D** *295/20*
U.S. Cl. 514—234 **10 Claims**

1. A compound of the formula



wherein R_1 is lower alkyl, lower cycloalkyl, aryl, or aralkyl; A is a direct bond, lower alkylene, or lower alkenylene; x is 1 or 2, provided that when x is greater than 1, different occurrences of the



group may be the same or different; Ar is phenyl, or naphthyl unsubstituted or substituted with lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, halogen, acetamido, amino, nitro, lower alkylamino, hydroxy, lower hydroxyalkyl, or cyano; W is alkylene containing from 1 to about 10 carbon atoms; B is —$NR_2CONR_3R_4$, wherein R_2 is hydrogen or alkyl of from 1 to about 6 carbon atoms and wherein R_3 and R_4 together with N form a morpholinyl group, or a pharmaceutically acceptable salt thereof.

7. A method for the treatment of prophylaxis of cardiac disorders in a mammal comprising administering to such mammal a short-acting β-blocking compound of the formula as in claim 1 and the pharmaceutically acceptable salts thereof.

9. A method of treating glaucoma or lowering intraocular pressure in a mammal, which comprises topically applying to the eye of said mammal an intraocular pressure-lowering effective amount of a compound of the formula as in claim 1 and the pharmaceutically acceptable salts thereof.

4,692,447

TRICYCLIC DIHYDROPYRIDAZINONES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Giorgio Cignarella; Carmelo A. Gandolfi; Odoardo Tofanetti; Piervitto Cipolla, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin, S.p.A., Milan, Italy

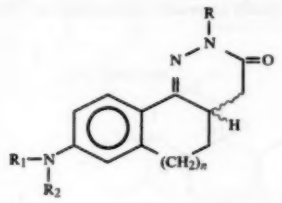
Filed Jul. 22, 1985, Ser. No. 757,429

Claims priority, application United Kingdom, Jul. 27, 1984, 8419253

Int. Cl.[4] C07D 237/36; A61K 31/50

U.S. Cl. 514—248 7 Claims

7. An antihypertensive, vasodilating, anti-aggregating, antithrombotic or cytoprotective pharmaceutical or veterinary composition in a form suitable for adminstration by intravenous, subcutaneous, intramuscular, rectal or implant routes, said composition comprising a pharmaceutically and/or veterinarily acceptable carrier and/or diluent and an antihypertensively, vasodilatingly, anti-aggregatingly, anti-thrombotically or cytoprotectively effective amount of a compound of formula I



wherein;

n is zero or an integer of 1 to 2

R is hydrogen, C_1–C_6 lower alkyl, $—CH_2—CH=CH_2$, $—CH_2—C\equiv CH$ and $(CH_2)_m—C_6H_5$ where m is zero or an integer of 1 to 3;

at least one of R_1 and R_2 is selected from the group consisting of

(a) $R_3—CO—$ wherein R_3 is selected from the group consisting of a C_1–C_{16} branched or unbranched alkyl chain which may be substituted by hydroxy, amino, halogen, thiol, or free or esterified carboxy group; a heterocyclic ring wherein R_3CO is the acyl part of a carboxylic acid R_3CO_2H selected from the group consisting of nictoinic, isonicotinic, pyrazol-3-carboxylic, isoxazol-3-carboxylic, isoxazol-5-carboxylic, 2-thiophencarboxylic and 2-furylcarboxylic acids; an aromatic ring wherein R_3CO is the acyl part of a carboxylic acid R_3CO_2H selected from the group consisting of benzoic, toluic, 3,4,5-trimethoxybenzoic, p-hydroxy-3,5-dimethoxybenzoic, p-fluorobenzoic, p-chlorobenzoic, p-aminobenzoic, salicyclic, and p-hydroxybenzoic acid; a C_3–C_7 cycloaliphatic ring; a C_4–C_{15} cycloaliphatic alkyl group; phenyl lower alkyl or phenoxy lower alkyl; moieties wherein R_3CO is the acyl part of a carboxylic acid R_3CO_2H selected from the group consisting of 1-imidazolylacetic, 2-furylpropionic, 2-tetrahydrofurylpropionic, cinnamic, 2-fluoro-cinnamic, and caffeic acid; a lower C_1–C_6 alkoxy, benzyloxy or NHR_6 group, wherein R_6 is hydrogen, C_1–C_6 lower alkyl or $—CH_2—C_6H_5$;

(b) $R_4SO_2—$, wherein R_4 is CH_3, C_2H_5, phenyl or p-methylphenyl; and the other of R_1 and R_2 is selected from the group consisting of hydrogen, C_1–C_6 lower alkyl, $(CH_2)_m—C_6H_5$, $(CH_2)_m—C_6H_{11}$, $(CH_2)_m—C_5H_9$ where m is zero or an integer of 1 to 3, $—CH_2—CH=CH_2$, $—CH_2—C\equiv CH$, $R_3—CO—$, and $R_4SO_2—$

and racemic or optically active enantiomers;

and pharmaceutically acceptable salts thereof.

4,692,448

BIS(ARYLPIPERAZINYL)SULFUR COMPOUNDS

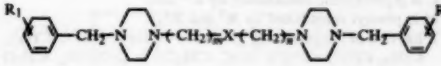
John P. Devlin, Sharon, and Karl D. Hargrave, Brookfield Center, both of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Filed Nov. 20, 1984, Ser. No. 673,474

Int. Cl.[4] A61K 31/495; C07D 403/12

U.S. Cl. 514—252 18 Claims

1. A compound of the formula:



wherein

R_1 and R_2 are each independently hydrogen, lower alkyl, halogen, nitrile or methylthio; m and n are each independently 2 or 3; and X is dithio or thio, and nontoxic, pharmaceutically acceptable addition salts thereof.

4,692,449

SUBSTITUTED QUINOLINEDIONES

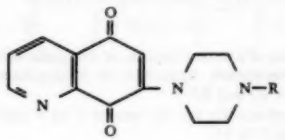
Jeffrey B. Medwid, West Nyack, and Lawrence W. Torley, Washingtonville, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 20, 1986, Ser. No. 876,600

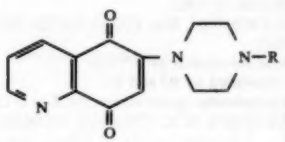
Int. Cl.[4] A61K 31/495; C07D 401/04

U.S. Cl. 514—254 10 Claims

1. A compound selected from the group consisting of those of the formulae:



(I)



(II)

wherein R is alkyl(C_1–C_3), carboalkoxy(C_2–C_4), alkanoyl(C_1–C_3), benzyl, phenyl, m-trifluoromethylphenyl, 2-pyridyl, 2-pyrimidyl, 2-benzoxazolyl or 2-benzo-thiazolyl and the pharmacologically acceptable acid-addition salts thereof.

8. A method of treating asthma and allergic diseases in a mammal which comprises administering to said mammal an effective amount of a compound of claim 1.

4,692,450

PHENYL-PYRIMIDINIUM, THIAZOLIUM OR IMIDAZOLIUM SALTS AND USE IN INHIBITING INTESTINAL RESORPTION OF CHOLESTEROL AND BILE SALTS

Jean-Marie Cassal, Mulhouse, France; Albrecht Edenhofer, Riehen, and Henri Ramuz, Birsfelden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

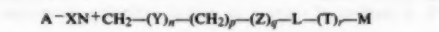
Filed Jan. 10, 1986, Ser. No. 817,638

Claims priority, application Switzerland, Jan. 16, 1985, 187/85

Int. Cl.[4] C07D 211/70, 211/82, 213/46, 239/02

U.S. Cl. 514—256 7 Claims

1. A polycyclic salt of the formula



I

wherein

A^- is an anion of a strong organic or inorganic acid;

XN^+ is, pyrimidinium, thiazolium or imidazolium substituted by R^1, R^2 and R^3;

n, q and r individually are the integer 1 or 0 and p is an integer from 1 to 15;

Y is CH_2, C(H,OH) or C(O);

Z is O, S, CH_2, C(O), NQ^1, SO_2, C(O)O, OC(O), C(O)N(Q^1) or N(Q^1)C(O);

L is p-phenylene substituted by R^4; and

M is phenyl substituted by R^5 and R^6,

T has one of the meanings given above, for Z or is $C(CH_3)_2$, C_2H_4, $C(Q^2)=C(Q^3)$, (C)C, $CH_2C(O)$, $C(O)CH_2$, CH_2O or OCH_2,

R^1 is a group Ar, Ar—C_{1-4}-alkyl, ArO or ArC(O),

Ar is phenyl substituted by R^7, R^8 and R^9;

R^2 and R^3 individually are H, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_6H_5,

with the proviso that the N-atom in the 3-position of an imidazolium group XN^+ is substituted by Ar, Ar—C_{1-4}-alkyl or C_{1-4}-alkyl,

R^4, R^5, R^6, R^7, R^8 and R^9 individually are H, halogen, CF_3, NO_2, CN, C_{1-4}-(alkyl, alkoxy, alkylthio or alkylsulphonyl), $SO_2N(R,Q)$, C(O)N(Q^4,Q^5), C(O)Q^4, C(O)OQ^4 or OC(O)Q^4,

R, Q, Q^1, Q^2 and Q^3 individually are H or C_{1-4}-alkyl, and

Q^4 and Q^5 individually are C_{1-4}-alkyl.

6. A method of inhibiting the intestinal resorption of cholesterol or of a bile salt in a mammal, comprising administering to the mammal a salt of the formula

$$A^-XN^+CH_2—(Y)_n—(CH_2)_p—(Z)_q—L—(T)_r—M \qquad I$$

wherein

A^- is an anion of a strong organic or inorganic acid;

XN^+ is, pyrimidinium, thiazolium or imidazolium substituted by R^1, R^2 and R^3;

n, q and r individually are the integer 1 or 0 and p is an integer from 1 to 15;

Y is CH_2, C(H,OH) or C(O);

Z is O, S, CH_2, C(O), NQ^1, SO_2, C(O)O, OC(O), C(O)N(Q^1) or N(Q^1)C(O);

L is p-phenylene substituted by R^4; and

M is phenyl substituted by R^5 and R^6,

T has one of the meanings given above, for Z or is $C(CH_3)_2$, C_2H_4, $C(Q^2)=C(Q^3)$, (C)C, $CH_2C(O)$, C(O)CH_2, CH_2O or OCH_2,

R^1 is a group Ar, Ar—C_{1-4}-alkyl, ArO or ArC(O),

Ar is phenyl substituted by R^7, R^8 and R^9;

R^2 and R^3 individually are H, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_6H_5,

with the proviso that the N-atom in the 3-position of an imidazolium group XN^+ is substituted by Ar, Ar—C_{1-4}-alkyl or C_{1-4}-alkyl,

R^4, R^5, R^6, R^7, R^8 and R^9 individually are H, halogen, CF_3, NO_2, CN, C_{1-4}-(alkyl, alkoxy, alkylthio or alkylsulphonyl, $SO_2N(R,Q)$, C(O)N(Q^4,Q^5), C(O)Q^4, C(O)OQ^4 or OC(O)Q^4,

R, Q, Q^1, Q^2 and Q^3 individually are H or C_{1-4}-alkyl, and

Q^4 and Q^5 individually are C_{1-4}-alkyl.

4,692,451

METHOD FOR PREVENTING STEREOTYPIC BEHAVIOR IN ANIMALS

Nicholas H. Dodman, Grafton, and Louis Shuster, Brookline, both of Mass., assignors to Trustees of Tufts College, Medford, Mass.

Filed Dec. 11, 1985, Ser. No. 807,814

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **9 Claims**

1. A method of treating an animal exhibiting stereotypic behavior which comprises administering a therapeutically effective amount of a narcotic antagonist to said animal.

4,692,452

METHOD FOR TREATMENT OF ENDOMETRITIS IN MAMMALIAN FEMALES

Antonin Cerny; Jiri Krepelka; Karel Rezabek; Maria Fruhaufova; Milan Pesak, all of Prague; Bohumil Sevcik; Josef Kral, both of Jilove u Prahy; Antonin Borovicka, Davle; Petr Bilek; Dagmar Picmausova, both of Prague; Josef Stuchlik, Hrabyne; Josef Picha, Jilove u Prahy, and Jana Strakova, Prague, all of Czechoslovakia, assignors to SPOFA, spojene podniky pro zdravotnickou vyrobu, Prague, Czechoslovakia

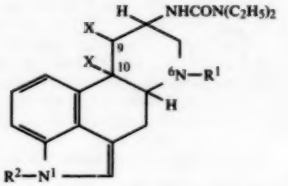
Filed Jun. 12, 1986, Ser. No. 873,616

Claims priority, application Czechoslovakia, Jun. 12, 1985, 4246-85

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—288 **6 Claims**

1. A method for the treatment of endometritis in mammalian females in need of said treatment comprising the administration to said mammalian female of an effective amount for treating endometritis of 1-(8-alpha-ergolinyl)-3,3-diethylurea derivative or a pharmaceutically acceptable acid addition salt thereof of Formula I



wherein R^1 is alkyl having from 1 to 3 carbon atoms, R^2 is selected from the group consisting of hydrogen and alkyl having 1 to 3 carbon atoms, and X is selected from the group consisting of hydrogen and a double bond between the carbon atoms at positions 9 and 10.

4,692,453

PHARMACEUTICAL ACTIVE 1,2,3,4,4A,5,10,10A-OCTAHYDROBENZO[G] QUINOLINE DERIVATIVES, AND THEIR USE

Max P. Seiler, Basle, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

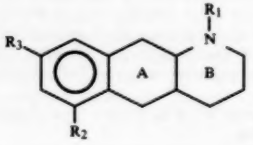
Continuation of Ser. No. 573,513, Jan. 25, 1984, abandoned. This application Nov. 13, 1985, Ser. No. 797,563

Claims priority, application Switzerland, Feb. 1, 1983, 560/83

Int. Cl.[4] A61K *31/47*; C07D *221/08*

U.S. Cl. 514—290 **7 Claims**

1. A benzo[g]quinoline of formula I



(I)

wherein

the rings A and B are trans-fused and

wherein

R_1 is (C_{1-5})alkyl,

R_2 is hydroxy or (C_{1-5})alkoxy, and

R_3 is hydrogen,

and when R_2 is hydroxy, its physiologically-hydrolysable and

-acceptable esters, in free base or in pharmaceutically acceptable salt form.

6. A method of inhibiting prolactin secretion in a subject in need of such treatment which method comprises administering to said subject an effective amount of a compound according to anyone of claims 1 in free or pharmaceutically acceptable salt form.

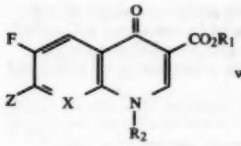
4,692,454

OPTHALMIC USE OF QUINOLONE ANTIBIOTICS

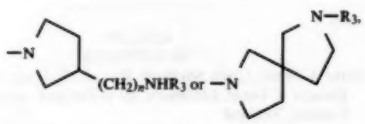
Thomas F. Mich, and Carl L. Heifetz, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 3, 1986, Ser. No. 825,007
Int. Cl.[4] A61K *31/47*
U.S. Cl. 514—312 **10 Claims**

1. A method of treating ocular bacterial infections which comprises topical ocular administration to an infected eye of an antibacterially effective amount of a compound of the formula



wherein Z is



in which n is zero or one and R_3 is hydrogen, methyl, ethyl, 1- or 2-propyl; X is CH, or CF; R_1 is hydrogen or alkyl having from one to six carbon atoms; R_2 is alkyl having from one to four carbon atoms, vinyl, haloalkyl, hydroxyalkyl having from two to four carbon atoms, or cycloalkyl having three to six carbon atoms, or an ophthalmologically acceptable acid addition or base salt thereof in admixture with a nontoxic pharmaceutical organic or inorganic carrier.

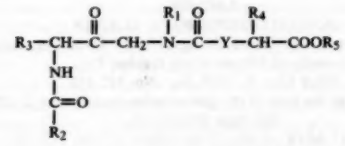
4,692,455

CERTAIN ACYCLIC, ALICYCLIC, AROMATIC OR HETEROCYCLIC DERIVATIVES OF 3-BENZOYLAMINO-2-OXO-BUTYL-AMINO-CARBONYL-OXY-3-PROPANOIC ACIDS, ESTERS THEREOF, PHARMACEUTICAL COMPOSITIONS CONTAINING SAME AND THEIR ENKEPHALINASE INHIBITING PROPERTIES

Eric M. Gordon, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 25, 1985, Ser. No. 694,871
Int. Cl.[4] C07C *125/04, 149/437;* C07D *213/55;* A61K *31/44*
U.S. Cl. 514—332 **10 Claims**

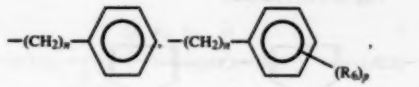
1. A compound of the formula



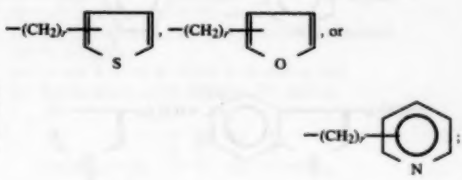
or a pharmaceutically acceptable salt thereof wherein:

Y is oxygen or sulfur;

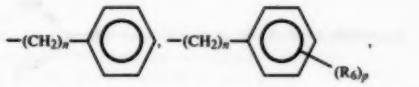
R_1 is hydrogen, lower alkyl,



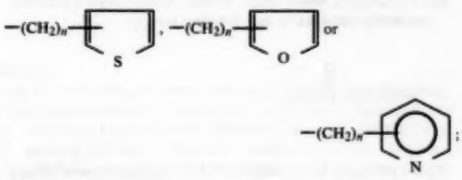
$-(CH_2)_n$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,



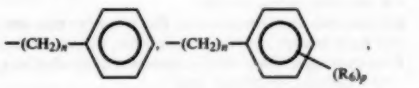
R_2 is hydrogen, lower alkyl,



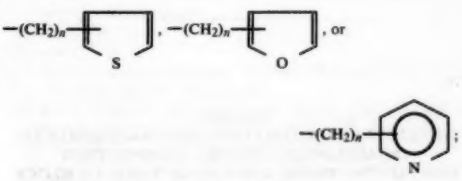
$-(CH_2)_n$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,



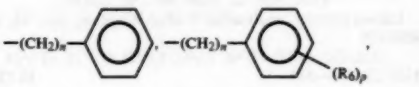
R_3 is hydrogen, lower alkyl,



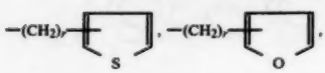
$-(CH_2)_n$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,

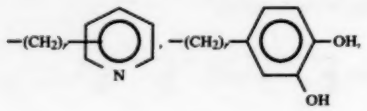


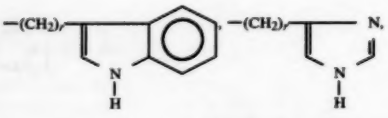
R_4 is hydrogen, lower alkyl,



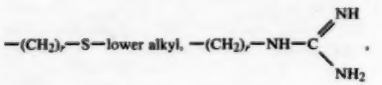
—$(CH_2)_n$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,

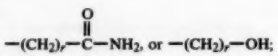




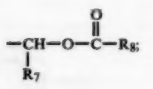


$-(CH_2)_r-NH_2$, $-(CH_2)_r-SH$,





R_5 is hydrogen, lower alkyl, benzyl, benzhydryl, a pharmaceutically acceptable salt forming ion, or



R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

n is zero, one, two, three, or four;

r is one, two, three, or four;

p is one, two, or three provided that p is more than one only if R_6 is methyl, methoxy, methylthio, chloro, or fluoro;

R_7 is hydrogen, lower alkyl, a saturated cycloalkyl ring of 3 to 7 carbons, or phenyl; and

R_8 is hydrogen, lower alkyl, lower alkoxy or phenyl.

4,692,456

3-PYRIDYLAMINOALKYLENEAMINO-4-AMINO-1,2,5-THIADIAZOLE-1-OXIDES, COMPOSITION CONTAINING THEM, AND USE OF THEM TO BLOCK HISTAMINE H_2-RECEPTORS

Robert J. Ife, Stevenage, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

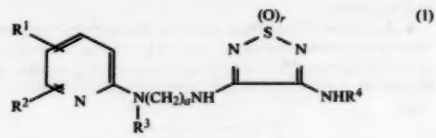
Filed Mar. 12, 1986, Ser. No. 838,972

Claims priority, application United Kingdom, Apr. 11, 1985, 8509276

Int. Cl.[4] A61K *31/44, 31/41;* **C07D** *417/12, 417/14*

U.S. Cl. 514—333 **18 Claims**

1. A compound of formula (1):



(1)

or a pharmaceutically acceptable salt thereof, where:

R^1 and R^2 are the same or different and are hydrogen, C_{1-6}alkyl, C_{1-6}alkoxy or halogen;

R^3 is C_{1-6}alkyl or optionally substituted phenyl or optionally substituted pyridyl, where the optional substituents are one or more C_{1-6}alkyl, C_{1-6}alkoxy, or hydroxy groups or halogen atoms;

a is from 2 to 4

R^4 is $(CH_2)_bR^5$ where b is 1–6 and

R^5 is

phenyl optionally substituted by one or more C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy, carboxy (or an C_{1-6} alkyl ester thereof) or sulphonamido groups or halogen atoms;

pyridyl optionally substituted by one or more C_{1-6}alkyl, C_{1-6}alkoxy or hydroxy groups or halogen atoms;

or N-oxo-pyridyl optionally substituted by C_{1-6}alkyl; and

r is 1 or 2.

18. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim **1**.

4,692,457

ACARICIDES

Peter J. West, Great Shelford; Russell G. Hunt, Burwell, and Duncan A. Gates, Littlebury, all of England, assignors to FBC Limited, England

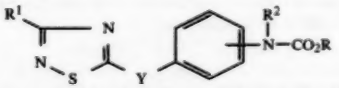
Filed Apr. 15, 1986, Ser. No. 852,181

Claims priority, application United Kingdom, Apr. 16, 1985, 85/09752

Int. Cl.[4] C07D *285/08;* **A01N** *47/18*

U.S. Cl. 514—361 **13 Claims**

1. A thiadiazole of the formula:



where: R^1 and R^2, which may be the same or different, are each hydrogen, optionally-halo or C_{1-4} alkoxy substituted alkyl of 1 to 10 carbon atoms, or optionally-halo or C_{1-4} alkoxy substituted phenyl, or R^1 is alkylthio of 1 to 6 carbon atoms; R is a halo or C_{1-4} alkoxy substituted or unsubstituted alkyl group of 1 to 8 carbon atoms, a halo or C_{1-4} alkoxy substituted or unsubstituted alkenyl or alkynyl group of 2 to 6 carbon atoms, a cycloalkyl group fo 3 to 6 carbon atoms, or a halo or C_{1-4} alkoxy substituted or unsubstituted aryl group; Y is oxygen or sulphur; and the carbamate grouping is in the 3- or 4-position on the phenyl ring.

4,692,458

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Mar. 5, 1980, Ser. No. 127,472

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*

U.S. Cl. 514—362 **78 Claims**

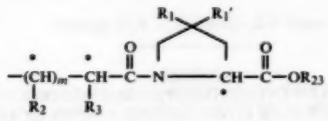
1. A new compound having the general formula I. R—A—S—Z, and the physiologically acceptable salts thereof, wherein:

R is selected from hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonylL-lysyl, pyro-L-glutamyl-L-lysyl, L-arginyl, L-lysyl and pyro-L-glutamyl,

A is selected from phenylalanyl, glycyl, alanyl, tryptophyl, tyrosyl, isoleucyl, leucyl, histidyl and valyl and the -amino group of A is in amide linkage with R when R is an acyl group and forms a primary amino group with R when R is hydrogen;

S is a sulfur atom joined to A in a thioester linkage; and

Z is selected from the following:



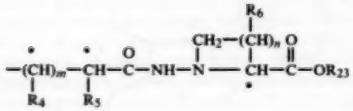
II.

wherein

(i) R_1 and R_1' are each hydrogen or halogen, and R_2 and R_3 are each hydrogen, lower alkyl or trifluoromethyl provided that only one of R_2 and R_3 may be trifluoromethyl and further provided that at least one of R_1, R_1', R_2 and R_3 must be halogen or trifluoromethyl;

(ii) R_{23} is hydrogen or lower alkyl and

(iii) m is 0 or 1;



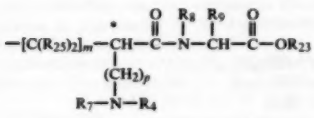
III.

wherein (i) R_4 and R_5 are each hydrogen, lower alkyl or phenyl-lower alkylene;

(ii) n is 1, 2 or 3;

(iii) R_6 is hydrogen or hydroxy or when n is 2, R_6 may also be halogen, and

(iv) m and R_{23} are as stated in II. above;



wherein

(i) R_7 is hydrogen, lower alkanoyl or amino (imino)-methyl;

(ii) p is 0 or an integer of from 1 to 4;

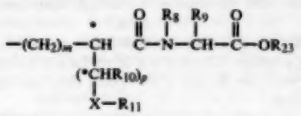
(iii) R_{25} is hydrogen but when m is 1, p is 0, R_4 is hydrogen and R_7 is lower alkanoyl, R_{25} may also be lower alkyl;

(iv) R_8 is selected from hydrogen, lower alkyl and hydroxy lower alkylene

when R_9 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, mercapto-lower alkylene, lower alkylthio-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene but R_8 and R_9 may together constitute a $(CH_2)_v$ bridge wherein v is 3 or 4, thus forming a 5 or 6-membered ring with the N and C to which R_8 and R_9 are respectively attached and in such instance when v is 3 one hydrogen of $(CH_2)_v$ may be replaced by OH or halogen and when v is 4, one such hydrogen may be replaced by OH;

(v) m and R_{23} are each as defined in II. above; and

(iv) R_4 is as defined in III. above, provided further, however, that m and p may not both be 0.



V.

wherein

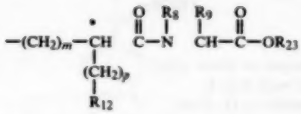
(i) r_{10} is hydrogen or lower alkyl;

(ii) R_{11} is hydrogen, lower alkyl or lower alkanoyl;

(iii) X is 0 or S;

(iv) m and R_{23} are as stated in II. above, and

(v) R_8, R_9 and p are as stated in IV. above;



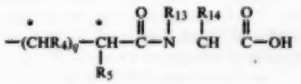
VI.

wherein

(i) R_{12} is selected from carboxy, lower alkoxycarbonyl, carbamoyl, N-substituted carbamoyl and cyano;

(ii) m and R_{23} are as stated in II. above; and

(iii) R_8, R_9 and p are as stated in IV. above;



VII.

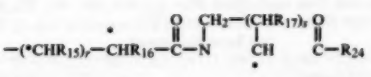
wherein

(i) R_{13} is hydrogen, lower alkyl or phenyl-lower alkylene;

(ii) R_{14} is selected from hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene;

(iii) R_4 and R_5 are as stated in III. above; and

(iv) q is 0, 1 or 2



VIII.

wherein

(i) R_{15} and R_{16} are each hydrogen, lower alkyl, phenyl or phenyl-lower alkylene;

(ii) r is 0, 1 or 2;

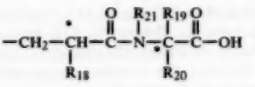
(iii) s is 1, 2, or 3;

(iv) R_{17} is hydrogen, hydroxy or lower alkyl and when s is 2, R_{17} may also be halogen; and

(v) R_{24} is hydroxy, amino or lower alkoxy; provided that when R_{24} is OH, s is 2, and R_{17} is H or OH:

(a) if r is 0, R_{16} may not be methyl or H, and

(b) if r is 1, R_{15} and R_{16} may not both be H and R_{16} may not be methyl if R_{15} is H

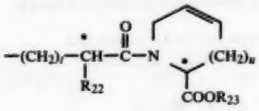


IX.

wherein

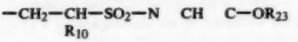
(i) R_{18} is hydrogen or lower alkyl;
(ii) R_{19} and R_{20} are each lower alkyl and may together constitute a $(CH_2)_w$ bridge wherein w is 4, to form a ring of 5-carbons with the carbon to which they are each attached;
(iii) R_{21} is hydrogen or lower alkyl and may constitute with R_{19} a $(CH_2)_x$ bridge wherein x is 3, to form a five-membered ring with the N and C to which they are respectively attached;
provided, however, that when R_{19} and R_{21} constitute $(CH_2)_x$, R_{18} may not be hydrogen or methyl

X.



wherein
(i) R_{22} is hydrogen or lower alkyl;
(ii) t and u are each 0 or 1;
(iii) R_{23} is as stated in II. above;
provided, however, that u may not be zero when R_{23} is H; and

XI.



wherein
(i) z is 2 or 3;
(ii) R_{10} is as stated in V. above, and
(iii) R_{23} is as stated in II above.

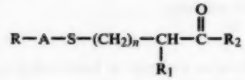
4,692,459

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation-in-part of Ser. No. 64,897, Aug. 14, 1979, Ser. No. 64,898, Aug. 14, 1979, Ser. No. 64,899, Aug. 14, 1979, Ser. No. 64,900, Aug. 14, 1979, Ser. No. 64,901, Aug. 14, 1979, Ser. No. 64,902, Aug. 14, 1979, Ser. No. 64,903, Aug. 14, 1979, Ser. No. 116,950, Jan. 30, 1980, abandoned, and Ser. No. 116,951, Jan. 30, 1980, abandoned, said Ser. No. 116,950, is a continuation of Ser. No. 941,289, Sep. 11, 1978, abandoned, said Ser. No. 116,951, is a continuation of Ser. No. 958,180, Nov. 6, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 121,188
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **6 Claims**

1. A new compound having the formula:



wherein
R is hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonyl-L-lysyl, pyro-L-glutamyl-L-lysyl, L-lysyl, L-arginyl or pyro-L-glutamyl;
A is D-phenylalanyl, D,L-alanyl, D-alanyl, D,L-tryptophyl, D-tryptophyl, D,L-tyrosyl, D-tyrosyl, D,I-isoleucyl, D-isoleucyl, D,L-leucyl, D-leucyl, D,L-histidyl, D-histidyl, D,L-valyl, or D-valyl, the α-amino group thereof being in amide linkage with R unless R is hydrogen; when R is not hydrogen, it being understood that when R is benzoyl and R_2 is a residue of L-proline or a dehydroproline, A may also be L-phenylalanyl
R_1 is hydrogen or methyl;
R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline, L -thiazolidine-4-carboxylic acid, or L-5-oxo-proline, the imino group thereof being in imide linkage with the adjacent

and,
n is 0 or 1, such that when n is 0, R_1 is methyl.

4,692,460

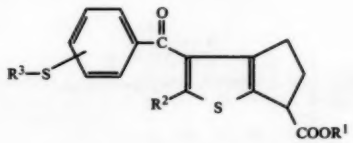
CYCLOPENTA[B]THIOPHENES HAVING ANTI-INFLAMMATORY ACTIVITY SIMILAR TO STEROIDS

John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

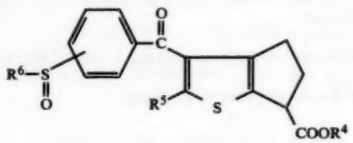
Filed Dec. 24, 1986, Ser. No. 946,555
Int. Cl.[4] A61K *31/38;* **C07D** *333/56*
U.S. Cl. 514—443 **15 Claims**

1. A cyclopentathiophene of the following formula (I) or (II)

(I)



(II)



wherein
R^1 and R^4 are hydrogen or alkyl;
R^2 and R^5 are alkyl; and
R^3 and R^6 are alkyl,
and the pharmaceutically acceptable base-addition salts thereof where R^1 or R^4 is hydrogen.

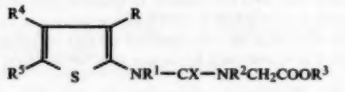
4,692,461

FUNGICIDAL THIENYLUREA DERIVATIVES

Werner Hallenbach, Langenfeld; Hans Lindel, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 21, 1986, Ser. No. 933,492
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541628
Int. Cl.[4] A01N *43/02;* **C07D** *333/56*
U.S. Cl. 514—443 **17 Claims**

1. A thienylurea derivative of the formula



in which
X represents oxygen or sulphur,
R represents cyano, hydroxycarbonyl or alkoxycarbonyl,
R^1 represents hydrogen or alkyl,
R^2 represents hydrogen or alkyl,
R^3 represents hydrogen, alkyl or optionally substituted aryl,
R^4 represents hydrogen, alkyl or optionally substituted aryl,
R^5 represents hydrogen, alkyl or optionally substituted aryl, or
R^4 and R^5 together represent the radical $-(CH_2)_n-$, and
n represents the numbers 3, 4, 5 or 6,
or an acid addition salt thereof.

4,692,462

COMPOSITIONS AND METHOD OF CONTROLLING TRANSDERMAL PENETRATION OF TOPICAL AND SYSTEMIC AGENTS

Pradip K. Banerjee, King of Prussia, Pa., assignor to Menley & James Laboratories, Ltd., Philadelphia, Pa.

Filed Mar. 18, 1985, Ser. No. 713,068
Int. Cl.[4] A61L *15/03*; A61F *13/00*
U.S. Cl. 514—449 **11 Claims**

1. A pharmaceutical composition for the controlled transdermal delivery of one or more pharmacologically active systemic drugs comprising a safe and effective amount of a systemic drug-ion exchange resin complex and a salt effective to control the drug release note, containing the appropriate counter ion for the ion-exchange resin, selected from the group consisting of sodium chloride, monobasic sodium phosphate, dibasic sodium phosphate, zinc sulfate, magnesium chloride, calcium chloride, potassium chloride, sodium sulfate, sodium acetate, magnesium acetate and sodium citrate in a gel-forming vehicle.

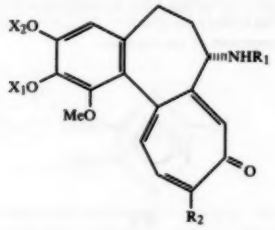
4,692,463

ANTIINFLAMMATORY 2,3-DIDEMETHYLCOLCHICINE AND ADDITIONAL DERIVATIVES

Arnold Brossi, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 705,709, Feb. 26, 1985, abandoned. This application Nov. 29, 1985, Ser. No. 802,680
Int. Cl.[4] A61K *31/36, 31/16*
U.S. Cl. 514—463 **8 Claims**

1. A method of treating inflammatory disorders in a mammal which comprises injecting said mammal with an effective anti-inflammatory amount of an anti-inflammatory agent set out below



$X_1=X_2=H$ or Acyl or $X_1—X_2=—CH_2—$;
R_1=acyl;
$R_2=OCH_3$.

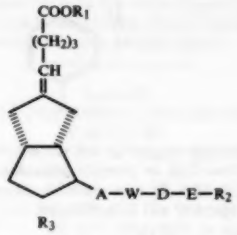
4,692,464

NOVEL PROSTACYCLIN DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

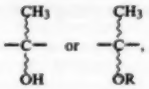
Werner Skuballa; Bernd Radüchel; Helmut Vorbrüggen; Gerda Mannesmann; Wolfgang Losert, and Jorge Casals, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Berkgamen, Fed. Rep. of Germany

Division of Ser. No. 86,506, Oct. 19, 1979, abandoned. This application Feb. 26, 1982, Ser. No. 352,411
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845770
Int. Cl.[4] C07C *177/00*; A61K *31/557*
U.S. Cl. 514—530 **31 Claims**

1. A prostane derivative of the formula



wherein
R_1 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{1-10} alkyl substituted by halogen; C_{1-4} alkoxy; C_{6-10} aryl; C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; di-C_{1-4}-alkylamino; or tri-C_{1-4}-alkylammonium; (d) C_{4-10} cycloalkyl, (e) C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms;
A is $—CH_2—CH_2—$, trans—CH=CH— or —C≡C—;
W is hydroxymethylene, RO-methylene,



wherein OH or OR is in the α- and/or β-position and
R is tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid;
D is C_{1-10} alkylene, C_{2-10} alkenylene or C_{2-10} alkynylene or one of these groups substituted by fluorine, and
E is —C≡C—;
R_2 is (a) a C_{1-10} hydrocarbon aliphatic radical, (b) a C_{6-10} hydrocarbon aliphatic radical substituted by C_{6-10} aryl or by C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; (c) C_{4-10} cycloalkyl, (d) C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, (e) C_{6-10} aryl, (f) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; or (h) an aromatic heterocycle of 5 or 6 ring atoms, one of which is O, N or S, the remainder being carbon atoms; and
R_3 is OH or OR; or, when R_1 is hydrogen, a physiologically compatible salt thereof with a base.

4,692,465

2-PHENYLETHYLAMINE DERIVATIVES

Richard M. Hindley, Reigate, and John Berge, Redhill, both of England, assignors to Beecham Group PLC, Middlesex, England

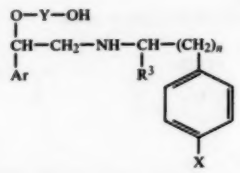
Filed Aug. 15, 1984, Ser. No. 640,850

Claims priority, application United Kingdom, Aug. 17, 1983, 8322137; Dec. 22, 1983, 8334293

Int. Cl.[4] A61K *31/24;* **C07C** *101/30*

U.S. Cl. 514—539 **13 Claims**

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:

Ar is benzofuran-2-yl, or phenyl optionally substituted by groups R^1 and/or R^2 wherein R^1 is halogen, trifluoromethyl or hydroxy and R^2 is halogen;

R_3 is hydrogen or methyl;

X is $—O(CH_2)_2CO_2H$ or $—CO_2H$ or a pharmaceutically acceptable ester or amide thereof, or $O(CH_2)_bM$ in which

a is an integer from 1 to 6,

b is an integer from 2 to 7,

M is hydroxy, C_{1-6} alkoxy, phenyl C_{1-6} alkoxy, or $—NR^4R^5$ in which R^4 and R^5 are each hydrogen or C_{1-6} alkyl or together form a five or six membered heterocyclic ring;

Y is C_{2-6} straight or branched alkylene, with at least two carbon atoms between the —O— and —OH; and

n is 1 or 2.

9. A pharmaceutical composition for the treatment and/or prophylaxis of obesity and/or hyperglycaemia comprising an effective amount of compound according to claim **1** together with a pharmaceutically acceptable carrier.

10. A method of treatment and/or prophylaxis of obesity and/or hyperglycaemia in mammals including humans which method comprises administering an effective, non-toxic amount of a compound according to claim **1**, to the mammal.

4,692,466

N-(2-CHLORO-4-TRIFLUOROMETHYLPHENYL)-3-TRIFLUOROMETHYLBENZENESULFONAMIDE DERIVATIVE AND AGRICULTURAL FUNGICIDE CONTAINING SAME

Takeo Yoshimoto, Yokohama; Mitsumasa Umemoto, Ohmuta; Keiichi Igarashi, Musashino; Yutaka Kubota; Hideo Yamazaki, both of Yokohama, Yuji Enomoto, Yokohama, and Hirohisa Yanagita, Chigasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

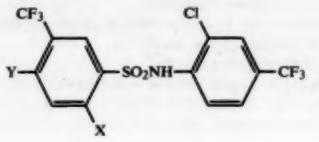
Filed Feb. 21, 1986, Ser. No. 831,546

Claims priority, application Japan, Feb. 28, 1985, 50-37701; Mar. 8, 1985, 50-44698

Int. Cl.[4] C07C *143/78;* **A01N** *41/04*

U.S. Cl. 514—604 **8 Claims**

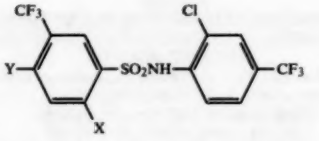
1. N-(2-chloro-4-trifluoromethylphenyl)-3-trifluoromethylbenzenesulfonamide derivative represented by the following formula (I):



(I)

wherein X and Y individually are a hydrogen or chlorine atom.

5. Agriculatural fungicidal composition comprising (a), as an active ingredient, a fungicidally effective amount of an N-(2-chloro-4-trifluoromethylphenyl)-3-trifluoromethylbenzenesulfonamide derivative represented by the following formula (I):



(I)

wherein X and Y individually are a hydrogen or chlorine atom, and (b) a carrier.

4,692,467

N'-CYANO-N-TETRAHYDROWNAPHTHYL-S-METHYISOTHIOUREA AS A GROWTH PROMOTING AGENT

Joseph E. Dunbar, Midland, Mich., and Kimiaki Maruyama, Hastings, Nebr., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 641,810, Aug. 17, 1984. This application Dec. 29, 1986, Ser. No. 947,128

Int. Cl.[4] A61K *31/155;* **C07C** *157/14*

U.S. Cl. 514—609 **3 Claims**

1. A method for promoting the growth of animals comprising administering to said animals an effective amount of the compound N'-cyano-N-(1,2,3,4-tetrahydro-1-naphthyl)-S-methylisothiourea.

3. The compound N'-cyano-N-(1,2,3,4-tetrahydro-1-naphtyl)-S-methylisothiourea.

4,692,468

CONTROL OF COLONIAL INSECTS EMPLOYING O-PHENYLENEDIAMINES

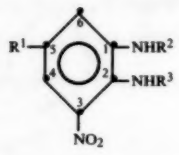
Rudolph J. Boisvenue, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 174,371, Aug. 1, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,426

Int. Cl.[4] A01N *37/18, 47/10*

U.S. Cl. 514—616 **7 Claims**

1. Method for eradicating a fire ant colony, which comprises supplying to the colony an effective amount of an active agent which is a compound of the formula

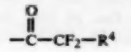


wherein R^1 represents

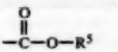
(1) halo,

(2) CF_3,

(3) CF_2H, or
(4) CF_2Cl;
one of R^2 and R^3 represents a 2,2-difluoroalkanoyl radical of the formula



wherein R^4 represents
(1) H,
(2) Cl,
(3) F,
(4) difluoromethyl, or
(5) trifluoromethyl;
and the other of R^2 and R^3 represents
(1) H,
(2) the same 2,2-difluoroalkanoyl radical represented by the first of R^2 and R^3,
(3) a radical of the formula



wherein R^5 represents loweralkyl of C_1–C_4 or phenyl,
(4) lower alkanoyl of C_2–C_5,
(5) benzoyl, or
(6) halogenated lower alkanoyl of C_2–C_5, subject to the limitation that the alpha position bears at least one substituent selected from the group consisting of hydrogen and halogen of atomic weight from 35 to 127, both inclusive;
subject to the further limitation that when R^3 represents a 2,2-difluoroalkanoyl radical, R^2 is a group other than H.

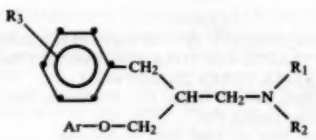
4,692,469

PROPYLAMINE DERIVATIVES

Jeffrey W. H. Watthey, Chappaqua, N.Y., assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

Continuation of Ser. No. 568,000, Jan. 4, 1984, Pat. No. 4,588,746, which is a continuation-in-part of Ser. No. 415,000, Sep. 7, 1982, abandoned. This application Apr. 4, 1986, Ser. No. 848,661
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—651 **3 Claims**

1. A method for the treatment of excessive appetite in mammals which consists of administering to a mammal in need thereof an effective appetite suppressing amount of a selective serotonin uptake inhibiting compounds of the formula



(IA)

wherein R_1 represents hydrogen or methyl; R_2 represents methyl; R_3 represents hydrogen; and Ar represents 4-trifluoromethylphenyl; or a pharmaceutically acceptable salt thereof; in combination with one or more pharmaceutically acceptable carriers.

4,692,470

PROCESS FOR INCORPORATING POWDERS IN VISCOUS FLUIDS

Bernard D. Bauman, Coopersburg, and Patricia E. Burdick, Whitehall, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 4, 1986, Ser. No. 825,832
Int. Cl.[4] C08J *9/40*
U.S. Cl. 521—55 **16 Claims**

1. The method of facilitating incorporation of finely divided polymeric solid particles into viscous liquids which comprises the use of a wetting agent effective in displacing adsorbed air from the surface, crevices and pores of such particles, said wetting agent being applied by pretreatment of the solid particles therewith prior to their admixture with the viscous liquid or by direct admixture with the viscous liquid prior to admixture of the solid particles into said viscous liquid, said wetting agent being a volatile organic blowing agent.

4,692,471

EXPANDABLE POLYPROPYLENE INTERPOLYMER PARTICLES

Kent D. Fudge, Glen Mills, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 851,391, Aug. 11, 1986. This application Dec. 29, 1986, Ser. No. 947,339
Int. Cl.[4] C08J *9/18*
U.S. Cl. 521—59 **6 Claims**

1. An expandable composition comprising a blend of
(1) 75–96% by weight of mixture of a polypropylene-poly(-vinyl aromatic monomer) interpolymer made by polymerizing 40 to 80% by weight based on interpolymer of a vinyl aromatic monomer in the presence of an aqueous suspension of a copolymer of propylene and sufficient olefin comonomer to give said copolymer a melting peak of less than 150° C., and
(2) 4–25% by weight of mixture of a polymer selected from the group consisting of polyethylene, ionomers, ethylene-vinyl acetate copolymers, ethylene-ethyl acrylate copolymers, chlorinated polyethylenes, chlorosulfonated polyethylenes, ethylene-propylene-diene monomer rubbers, ethylene-propylene rubbers, styrene-butadiene block copolymers, and polyethylene-poly(vinyl aromatic monomer) interpolymer;
(3) 0–5% by weight of a lubricant and cell control agent; and said composition having been heated to 175° C. to 185° C. in order to viscbreak the interpolymer of (1), supra
(4) 3–20% by weight of a blowing agent.

4,692,472

DIVINYLBENZENE IN EXPANDABLE BEADS FOR CUP MOLDING

Alvin R. Ingram, West Chester, and Adolph V. DiGiulio, Wayne, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 5, 1986, Ser. No. 859,976
Int. Cl.[4] C08J *9/18*
U.S. Cl. 521—60 **2 Claims**

1. The process of making expandable styrenic polymer beads for use in producing foamed cups with improved strength and thermal properties comprising the steps of:
(a) forming an aqueous suspension of a vinyl aromatic monomer, divinylbenzene, and a mixture of monomer-soluble free-radical-producing catalysts, with the aid of a suitable suspending agent system, said monomers being used in a monomer/water ratio of 0.3 to 1.5 parts by weight monomer solution per 1.0 part by weight water;
(b) heating the suspension at a temperature of about 50°–95° C. for 3–7 hours to copolymerize said monomers;
(c) heating the resulting bead slurry to a temperature of about 100°–150° C. for a period of about 0.25–5.0 hours to

complete the copolymerization while forming copolymers;

having a gel content of 0–50% by weight and a toluene soluble portion having a weight average molecular weight of between 280,000 and 750,000, a polydispersity of 3.0–7.0, and bead size of through 30 and on 80 mesh, U.S. Standard Sieve;

(d) adding 3 to 12% by weight of a blowing agent selected from the group consisting of aliphatic hydrocarbons containing 4–6 carbon atoms, halogenated hydrocarbons which boil at a temperature below the softening point of the polymer, and mixtures thereof;

(e) heating the suspension at a temperature of from 80°–150° C. to impregnate the polymer beads with blowing agent; and

(f) cooling the suspension to room temperature, and separating the impregnated beads from the aqueous system.

4,692,473

WATER BORNE POLYMER FOAMABLE COMPOSITION

Thomas C. Wright, and Grover L. Johnson, both of Arlington, Tex., assignors to Orin Chemical Company, Arlington, Tex.

Filed Apr. 26, 1985, Ser. No. 727,497

Int. Cl.[4] C08J 9/30

U.S. Cl. 521—72 **8 Claims**

1. A multi-part composition for preparing a foamed polyvinyl product wherein the compositions contains at least two separate parts which are to be mixed to prepare the foamed product in a manner known per se, said first part being a vinyl acetate polymer selected from the group consisting of vinyl acetate polymer and vinyl acetate-ethylene copolymers and the second part being selected from the group consisting of sodium bicarbonate and a carbonate foaming agent and wherein with said carbonate foaming agent there is included in one of or both of the first and second parts an acid compound selected from the group consisting of citric acid, acetic acid, tartaric acid, alkali citrate, alkali bitatrate, calcium phosphate, and mixtures thereof; and the carbonate is selected from the group consisting of sodium bicarbonate, magnesium carbonate, ammonium bicarbonate and zinc carbonate; and wherein the composition comprises:

100 parts by weight of a water based emulsion of said polymer;

2–15 parts by weight of sodium bicarbonate or said carbonate foaming agent and said acid compound;

0–25 parts by weight of cross-linking reagents;

0–20 parts by weight of filler;

0–5 parts by weight of thickners.

4,692,474

METHOD FOR PREPARING PLASTIC FOAMS

Hans Mayer; Rudolf Mühlhofer; Bernward Deubzer, all of Burghausen, and Walter Mayerhofer, Marktl, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,329

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 3524493

Int. Cl.[4] C08J 9/02

U.S. Cl. 521—88 **7 Claims**

1. A method for preparing plastic foams, which comprises reacting a compound containing Si-bonded hydrogen and at least one SiC-bonded radical having at least one basic nitrogen atom in the same molecule with a compound containing at least one hydroxyl group.

4,692,475

BLOWING AGENT COMPOSITION

Donald G. Rowland, Woodbridge, Conn.; Byron A. Hunter, Alpine, and Lee D. Hansen, Orem, both of Utah, assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 825,401, Mar. 25, 1986, Pat. No. 4,655,962. This application Dec. 10, 1986, Ser. No. 940,873

Int. Cl.[4] C08J 9/10

U.S. Cl. 521—92 **10 Claims**

1. A foamable polymeric composition, comprising (a) at least one member selected from the group consisting of foamable polymers and monomers or coreactants polymerizable under blowing conditions, and (b) an effective amount of a blowing agent composition (i) azodicarbonamide; (ii) at least one member selected from the group consisting of zinc oxide and zinc carbonate; and (iii) at least one member selected from the group consisting of zinc salts of C_1–C_6 organic acids, and C_1–C_6 carboxamides.

4,692,476

COMPLEX BLOCK MULTIPOLYMER SURFACTANTS

Scott Simpson, Woodstock, Conn., assignor to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 559,823, Dec. 9, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,544

Int. Cl.[4] C08G 77/04; C08J 9/00

U.S. Cl. 521—112 **17 Claims**

1. A complex block multipolymer surfactant having a molecular weight of between about 15,000 and about 100,000 produced by combining:

(a) a linear polysiloxane having terminating groups containing a hydroxyl group, said linear polysiloxane having a molecular weight of between about 1,000 and about 5,000;

(b) at least one diol, said diol having a molecular weight of less than about 5,000; and

(c) a diisocyanate having isocyanate reactive groups, said diisocyanate having a molecular weight of between about 100 and about 2,000;

the ratio of hydroxyl groups to isocyanate reaction groups being from about 0.80:1.0 to about 1.16:1.0; and

wherein said surfactant has a silicon content of between about 0.5 to about 35.0 percent by weight.

17. A polyurethane foam containing a stabilizer comprising a complex block multipolymer surfactant having a molecular weight of between about 15,000 and about 100,000 produced by combining:

(a) a linear polysiloxane having terminating groups containing a hydroxyl group, said linear polysiloxane having a molecular weight of between about 1,000 and about 5,000;

(b) at least one diol, said diol having a molecular weight of less than about 5,000; and

(c) a diisocyanate having isocyanate reactive groups, said diisocyanate having a molecular weight of between about 100 and about 2,000;

the ratio of hydroxyl groups to isocyanate reaction groups being from about 0.80:1.0 to about 1.16:1.0; and

wherein said surfactant has a silicon content of between about 0.5 to about 35.0 percent by weight.

4,692,477

POLYISOCYANURATE FOAMS DERIVED FROM OXYPROPYLATED POLYOLS AND INSULATING STRUCTURES THEREFROM

Charles E. Jacobina, Bellear Beach, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed May 15, 1986, Ser. No. 863,648

Int. Cl.[4] C08G 18/14

U.S. Cl. 521—174 **20 Claims**

1. A rigid polyisocyanurate foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol, the polyol comprising a sufficient proportion of at least one polyoxyalkyl-

ene polyol having (i) terminal oxypropylene oxide blocks, (ii) a molecular weight of from about 300 to 3000, and (iii) an average hydroxyl functionality of from about 2 to 5 form a foamed polyisocyanurate whose gel time is greater than about 70 seconds and friability is less than about 20 percent as measured by the ASTM C-421 friability test, and the catalyst being one whose use gives rise to the gel time of greater than about 70 seconds.

4,692,478

PROCESS FOR PREPARATION OF RESIN AND RESIN OBTAINED

Tito Viswanathan, Little Rock, Ark., and Donald H. Westermann, Greenfield, Wis., assignors to Chemical Process Corporation, Greenfield, Wis.

Filed Mar. 14, 1986, Ser. No. 839,513

Int. Cl.[4] C08L *3/02, 5/00, 5/02*

U.S. Cl. 527—300 **13 Claims**

1. The process for preparing a thermosetting resin for bonding lignocellulosic materials to form a product, such as plywood and particle board, which process comprises first reacting an aqueous preparation consisting essentially of carbohydrate in a closed reactor at an elevated temperature of about 140° C. to about 250° C. with sufficient mineral acid, to produce a pH of about 0.5 to 2.0, and to convert the carbohydrate to polymerizable reactants, and then when that reaction is over reacting the thus obtained reactants with ammonia at a pH above 3.0 to form a storage stable, water soluble, thermosetting resin which can be further cross-linked by exposure to heat.

4,692,479

SELF-SETTING URETHANE ADHESIVE PASTE SYSTEM

James T. Schneider, Powell, and Albert L. Haugse, Dublin, both of Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Filed Jul. 19, 1985, Ser. No. 756,632

Int. Cl.[4] B22B *1/22;* C08K *3/36, 9/06;* C08L *61/06*

U.S. Cl. 523—209 **49 Claims**

1. An adhesive paste comprising in admixture a resin component, a hardener component, a filler component and a curing agent, said resin component including a polyol having at least two hydroxyl groups, said hardener component including a liquid polyisocyanate containing at least two isocyanate groups, said curing agent comprising a base, and said filler component comprising a hydrophobic filler material which is a thixotropic agent, such that the relative weight ratio of resin component to hardener component is from 45:55 to 55:45, the relative weight ratio of curing agent to resin component is from 0.01:99:99 to 15:85, and the relative weight ratio of the hydrophobic filler to hardener component is from 0.5:99.5 to 20:80.

4,692,480

THERMOPLASTIC RESIN COMPOSITION

Katsuhiko Takahashi, Fuji, and Michiyuki Sugita, Shizuoka, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Apr. 10, 1986, Ser. No. 850,205

Claims priority, application Japan, Apr. 12, 1985, 60-77793

Int. Cl.[4] C08K *7/28, 7/24*

U.S. Cl. 523—218 **9 Claims**

1. A thermoplastic resin composition which comprises a thermoplastic resin and a spherical, hollow filler wherein said filler has a wall thickness ratio of about 2.5 to about 10, said ratio defined by the ratio of the outer diameter of the filler to the wall thickness of the filler.

4,692,481

PROCESS FOR MATCHING COLOR OF PAINT TO A COLORED SURFACE

Renee J. Kelly, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1984, Ser. No. 655,088

Int. Cl.[4] C08K *7/28, 7/00, 3/08;* C09D *5/38*

U.S. Cl. 523—219 **20 Claims**

1. An improved process for visually matching the color characteristics at at least three viewing angles of a dried paint film formed from a wet paint comprising film forming binder, a liquid carrier of solvent or water, colored pigments and flake pigments to the color characteristics of a surface layer that contains flake pigments: wherein the improvement comprises

adding to the wet paint a dispersion comprising a liquid carrier of solvent or water, a dispersing agent and extender pigment consisting of hollow glass spheres having a diameter of about 0.1–50 microns in an amount sufficient for a dried film of the paint to match the color characteristics of the surface layer.

4,692,482

METHOD OF CONCENTRATING POLYPHENYLENE ETHER SOLUTIONS

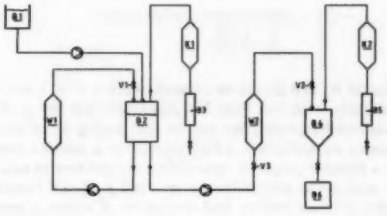
Gregor Lohrengel, Essen, Fed. Rep. of Germany, assignor to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 22, 1986, Ser. No. 921,463

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600754

Int. Cl.[4] C08J *3/00;* C08L *71/04*

U.S. Cl. 523—340 **6 Claims**



1. A method for the continuous production of a polyphenylene ether solution, comprising the steps of:

continuously feeding a dilute solution of polyphenylene ether in an organic solvent to a first flash evaporatoring stage which is processed by

recycling a slightly concentrated polyphenylene ether solution

feeding a portion of this slightly concentrated solution to a second flash evaporatoring stage which is processed in a direct flow through manner and

collecting the concentrated polyphenylene ether effluent solution from said second flash evaporator.

4,692,483

WATER-BASED PAINT COMPOSITION

Yasuyuki Tsuchiya, Hirakata, and Hiroyuki Sakamoto, Nishinomiya, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 25, 1986, Ser. No. 855,644

Claims priority, application Japan, Apr. 26, 1985, 60-91715; Apr. 26, 1985, 60-91716

Int. Cl.[4] C08K *3/20;* C08L *83/00, 37/00*

U.S. Cl. 523—406 **15 Claims**

1. A water-based paint composition comprising:

(A) 100 parts by weight of a hydrophilic film-forming resin component capable of curing through an oxidative polymer-

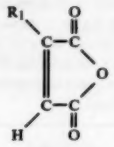
ization reaction and having a plurality of pendant free carboxy groups; and

(B) 10 to 200 parts by weight of a hydrophobic film-forming resin component having a plurality of polymerizable carbon-to-carbon double bonds at terminals;

said component (A) being

(I) reaction product prepared by the steps of

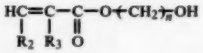
(a) reacting (i) a butadiene-based polymer having an average number molecular weight of 500 to 5,000 and an iodine number of 100 to 500, a drying oil having an iodine number greater than 100, or a mixture thereof, with 100 to 300 millimoles, per 100 g of (i), of (ii) a dicarboxylic acid anhydride of the formula:



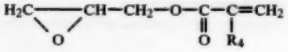
wherein R_1 represents a hydrogen atom, a halogen atom or methyl, and

(b) reacting the resultant product with at least 0.8 moles per mole of said acid anhydride of (iii) water, a primary monoalcohol, a dialkylamine or a mixture thereof, or

(II) either (i) a product prepared by reacting the product of said step (a) with 10 to 300 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of a compound of the formula:



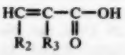
wherein R_2 and R_3 are as defined, and n is 2 or 3, and then optionally with less than 290 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of water, a primary monoalcohol, a dialkylamine or a mixture thereof; (ii) a product prepared by reacting the product of said step (a) with 80 to 300 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of water, a primary monoalcohol, a dialkylamine or a mixture thereof, and then with 10 to 500 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of a monoglycidyl ester of the formula:



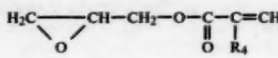
wherien R_4 is as defined; or a mixture of said products (i) and (ii); or

(III) a mixture of (I) and (II);

said component (B) being (i) a product prepared by reacting a compound having at least one glycidyl group and an average molecular weight of 300 to 4,000 with 0.8 to 1.1 moles per said glycidyl group of an ethylenically unsaturated carboxylic acid of the formula:



wherein R_2 and R_3 independent represent a hydrogen atom or methyl, or an unsaturated fatty acid having a molecular weight of 100 to 350 and an iodine number greater than 100, or (ii) a product prepared by reacting a polymeric phenol derivative having an average number molecular weight of 300 to 4,000 with at least 0.8 moles per moles of said phenol derivative of a monogylcidyl ester of the formula:



wherein R_4 represents a hydrogen atom or methyl, or (iii) a mixture of (i) and (ii);

said components (A) and (B) being dispersed in an aqueous medium containing an amount of a base sufficient to neutralize at least 20% of said free carboxylic groups to form a stable emulsion of resinous particles composed of a core of said component (B) surrounded by a shell layer of said component (A).

4,692,484

EPOXY-PHOSPHATE/PHENOLIC ELECTROCOATING COMPOSITIONS

Donald R. Roberts, Roselle, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Sep. 25, 1985, Ser. No. 779,947

Int. Cl.[4] **C08K** *5/06;* **C08L** *63/02, 61/12*

U.S. Cl. 523—414 **17 Claims**

1. An aqueous dispersion adapted for electrocoating metal surfaces comprising from about 5 percent to about 50 percent, based on the total weight of nonvolatile resin solids, of a water insoluble, heat-hardening bisphenol-A-based phenolic resin as curing agent; the balance of the resin solids consisting essentially of an epoxy-free epoxy-phosphate comprising the reaction product of orthophosphoric acid with a diglycidyl ether of bisphenol having an average molecular weight of from about 500 to about 5000 and a 1,2-epoxy equivalence in the range of about 1.3–2.0, said reaction product containing from about 0.05 mol to about 0.9 mol of phosphoric acid per epoxide equivalent in said diglycidyl ether; and a volatile amine in an amount sufficient to react with from about 50 percent to about 400 percent of the acid content of the epoxy-free epoxy-phosphate, said dispersion being effected with the aid of a water miscible organic solvent comprising at least about 10 percent of an ether alcohol to provide organic solvent in a weight ratio relative to water of about 5.95 to about 50:50.

4,692,485

VINYL BENZYL 2,2,6,6-TETRAMETHYL PIPERIDINES

William E. Leistner, Atlantic Beach, N.Y.; Yutaka Nakahara, Okegawa, Japan; Bunji Hirai, Kuki, Japan, and Mitsuharu Kanai, Kuki, Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

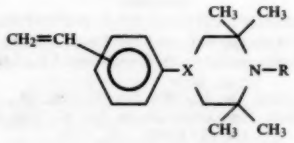
Filed Dec. 5, 1985, Ser. No. 806,251

Claims priority, application Japan, Dec. 5, 1984, 59-257060

Int. Cl.[4] **C07D** *498/10;* **C08K** *5/34, 5/35*

U.S. Cl. 524—99 **25 Claims**

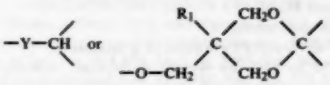
1. A vinyl benzyl 2,2,6,6-tetramethyl piperidine having the formula:



wherein:

R is selected from the group consisting of hydrogen; oxyl; acyl and alkyl having from one to about eighteen carbon atoms;

X is



in which Y is —O— or —N(R_2)—, R_1 is alkyl having from one to about eighteen carbon atoms and R_2 is hydrogen or alkyl having from one to about eighteen carbon atoms.

20. An α-olefin polymer composition having improved resistance to deterioration upon exposure to light, comprising an α-olefin polymer and a vinyl benzyl 2,2,6,6-tetramethyl piperidine according to claim **1**.

4,692,486

SYNERGISTIC MIXTURE OF LOW-MOLECULAR AND HIGH-MOLECULAR POLYALKYLPIPERIDINES

Francois Gugumus, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

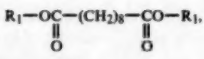
Continuation of Ser. No. 433,764, Oct. 12, 1982, abandoned. This application Jul. 21, 1986, Ser. No. 887,961

Claims priority, application Switzerland, Oct. 16, 1981, 6623/81

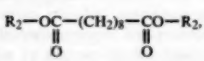
Int. Cl.[4] **C08K** *5/34, 5/35*

U.S. Cl. 524—100 **6 Claims**

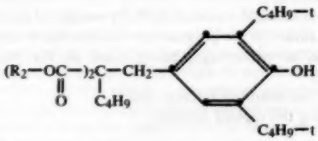
1. A stabiliser system consisting essentially of (A) a low-molecular, sterically hindered polyalkylpiperidine selected from the compounds of the formulae



(A-1)

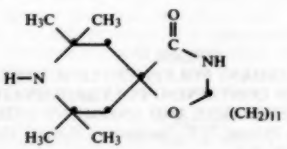


(A-2)



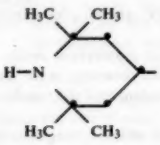
(A-9)

and

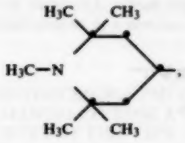


(A-11)

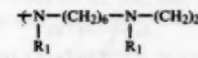
in which R_1 is a group of the formula



and R_2 is a group of the formula

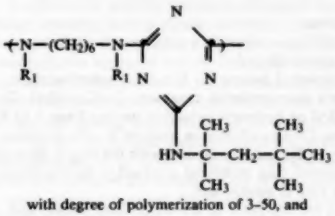


and (B) a high-molecular, sterically hindered polyalkylpiperidine selected from the compounds of formulae



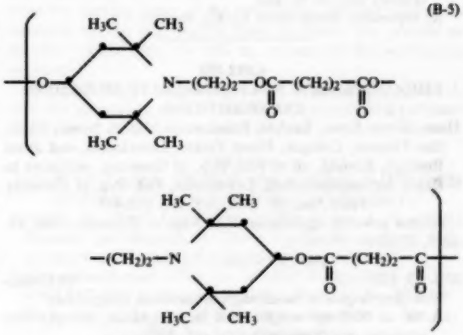
(B-2)

with degree of polymerization of 5–50,



(B-4)

with degree of polymerization of 3–50, and



(B-5)

with degree of polymerization of 2–25

wherein R_1 is as defined above, said components being present in a weight ratio of 5:1 to 1:5.

6. Organic polymeric material containing 0.01 to 5% by weight, based on the organic material, of the stabiliser system according to claim **1**.

4,692,487

1,2-ETHANEDIYL-BIS-2-PIPERAZINONE ESTERS, OLIGOMERS THEREOF, AND COMPOSITIONS STABILIZED THEREBY

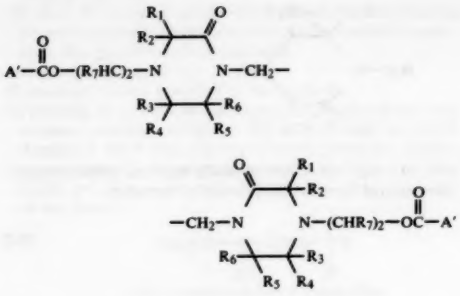
Pyong-Nae Son, Akron, and John T. Lai, Broadview Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 696,123, Jan. 29, 1985, abandoned. This application Sep. 2, 1986, Ser. No. 902,541

Int. Cl.[4] **C08K** *5/34*

U.S. Cl. 524—100 **8 Claims**

1. An esterified bis-polysubstituted piperazinone ("bis-PSP") represented by the structure



wherein,

A′ represents

$CH_3—(CH_2)_x—$ wherein x is an integer in the range from 6 to about 20; and,

hydroxyphenyl having C_1–C_{10} alkyl substituents;

R_1–R_4 each independently represent C_1–C_{12} alkyl; C_5–C_{14} cycloalkyl or hydroxycycloalkyl having from 5 to 8 ring C atoms, C_7–C_{14} alkenyl or aralkyl; C_2–C_7 alkylene;

R_1 and R_2, or R_3 and R_4 together with the ring C atom of the piperazinone ring represent cycloalkyl having from 5 to about 8 ring C atoms; and,

R_5 and R_6 are the same as R_1–R_4 defined above, and additionally may be H; and,

R_7 represents lower alkyl C_1–C_6, and H.

4,692,488

THERMOPLASTIC POLYCARBONATE MOULDING COMPOSITIONS

Hans-Jürgen Kress, Krefeld; Friedemann Müller, Neuss; Christian Lindner, Cologne; Horst Peters, Leverkusen, and Josef Buekers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,495

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523314

Int. Cl.⁴ C08K *5/53, 5/52*

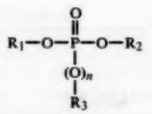
U.S. Cl. 524—139 **18 Claims**

1. A thermoplastic moulding composition comprising

A. 60 to 90% by weight of a thermoplastic, halogen-free aromatic polycarbonate,

B. 10 to 40% by weight of a halogen-free thermoplastic copolymer of 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene or mixtures thereof and 5 to 50% by weight of (meth)acrylonitrile,

C. 1 to 20 parts by weight, per 100 parts by weight of the total weight of A. and B., of a halogen-free phosphorus compound of the general formula



(I)

in which

R_1, R_2 and R_3 independently of one another denote a C_1–C_8-alkyl radical or an optionally alkyl-substituted C_6–C_{20}-aryl radical and n is 0 or 1, and

D. 0.05 to 2.0 parts by weight, per 100 parts by weight of the total weights of A. and B., of a tetrafluoroethylene polymer with average particle sizes of 0.05 to 20 μm and a density of 1.2 to 1.9 g/cm³, component D. being employed in the form of a coagulated mixture of emulsions of the tetrafluoroethylene polymers D. with emulsions of not more than 3 parts by weight, but at least 0.1 parts by weight, per 100 parts by weight of the sum of components A. and B., of

E. graft polymer(s) of

1. 5 to 90 parts by weight of a mixture of

(i) 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof and

(ii) 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof, on

2. 95 to 10 parts by weight of a rubber with a glass transition temperature $T_G \leqq 10°$ C., and the weight ratio of graft polymer E. to tetrafluoroethylene polymer D. being between 95:5 and 60:40.

4,692,489

POLYPROPYLENE COMPOSITIONS OF IMPROVED CLARITY

Harold K. Ficker, Wayne, N.J., and Frederick M. Teskin, Herndon, Va., assignors to El Paso Products Company, Odessa, Tex.

Filed Aug. 6, 1985, Ser. No. 762,904

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.⁴ C08K *5/09, 5/17*

U.S. Cl. 524—243 **6 Claims**

1. A method for improving the color and clarity of an undeashed propylene polymer prepared in the presence of a high-activity catalyst composition containing a magnesium halide-supported titanium halide catalyst component, which method consists essentially of

(a) adding (i) from about 0.01 to about 3% by weight of a neutralizer selected from the group consisting of hydroxides of sodium, potassium and calcium, oxides of calcium and magnesium, sodium carbonate, calcium carbonate, magnesium hydroxycarbonates and mixtures thereof,

(ii) from about 0.01 to about 1% by weight of sodium benzoate and

(iii) from about 0.05 to about 0.5% by weight of an ethoxylated amine to the polymer in the absence of calcium stearate, all percentages being based on the polymer weight,

(b) melting the resulting mixture and

(c) solidifying the melted mixture.

4,692,490

FLAME RETARDANT POLYPHENYLENE ETHER COMPOSITION CONTAINING POLYBROMINATED DIPHENYOXYBENZENE AND ANTIMONY OXIDE

Visvaldis Abolins, Delmar, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,441

Int. Cl.⁴ C08K *5/06*

U.S. Cl. 524—371 **13 Claims**

1. A flame retardant thermoplastic composition comprising

(a) a polyphenylene ether resin;

(b) a rubber modified, high impact polystyrene resin;

(c) a polybrominated 1,4-diphenoxybenzene in an amount which improves the flame retardancy of the combination of (a) and (b); and

(d) antimony oxide in an amount which synergistically enhances the flame retardancy of the combination of (a), (b) and (c).

4,692,491

POLYMER EMULSION PRODUCTS

Ajay I. Ranka, Allison Park, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 814,458, Dec. 30, 1985, Pat. No. 4,647,612.
This application Sep. 15, 1986, Ser. No. 907,563
Int. Cl.[4] C08L 41/00
U.S. Cl. 524—458 10 Claims

10. The polymer of claim 1 in which the salt of the carboxylic acid group-containing polymer is a salt of a carboxylic acid group-containing acrylic polymer.

4,692,492

NON-STAINING, NON-STICKING STYRENIC POLYMERS

Binnur Z. Gunesin, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 614,081, May 25, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 789,886
Int. Cl.[4] C08K 5/54
U.S. Cl. 524—731 9 Claims

1. A method for preparing a non-staining, non-sticking, high impact polystyrene, which comprises: (a) a solution formed by dissolving a rubber in a mixture consisting essentially of a styrene, a polysiloxane and a solvent; (b) heating the resultant solution to graft polymerize the styrene onto the rubber; and (c) separating the solvent and any unreacted styrene present.

4,692,493

STABLE, AQUEOUS, COLLOIDAL DISPERSIONS OF COPOLYMERS OF THE TETRAFLUORETHYLENE/ETHYLENE TYPE AND A PROCESS FOR THEIR PREPARATION

Reinhard A. Sulzbach, Burghausen, and Konrad von Werner, Halsbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,640
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512633
Int. Cl.[4] C08L 27/12
U.S. Cl. 524—805 9 Claims

1. A process for the preparation of a stable, aqueous, colloidal dispersion of a copolymer comprising at most 60 mol % of copolymerized tetrafluoroethylene units, 60 to 40 mol % of copolymerized ethylene units and 0 to 15 mol % of copolymerized units of at least one further α-olefinic comonomer, said dispersion being substantially free of non-fluorinated emulsifiers, which process includes the step of copolymerizing these comonomers in aqueous phase in the presence of conventional initiators forming free radicals and the in the presence of fluorinated carboxylic acids or salts thereof, said fluorinated carboxylic acids or salts thereof consisting essentially of a mixture of

(a) 98 to 80% by weight of perfluorooctanoic acid or alkali metal or ammonium salts thereof and

(b) 2 to 20% by weight of perfluorononanoic acid or perfluorodecanoic acid or alkali metal or ammonium salts thereof.

4,692,494

WATER SOLUBLE FILMS OF POLYVINYL ALCOHOL AND POLYACRYLIC ACID AND PACKAGES COMPRISING SAME

Gerard G. Sonenstein, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 216,358, Dec. 15, 1980, abandoned. This application Aug. 13, 1981, Ser. No. 292,477
Int. Cl.[4] C08L 29/04
U.S. Cl. 525—57 7 Claims

1. A coherent self-supporting water-soluble film comprising a uniform mixture of water soluble polyvinyl alcohol which is about 79% to about 95% hydrolyzed polyvinylacetate and has a weight average molecular weight of about 10,000 to about 50,000, and polyacrylic acid having a weight average molecular weight of about 30,000 to 400,000 in a weight ratio of about 10:1 to about 1:1, which film further contains an effective biocidal amount of a non-toxic biocide.

4,692,495

REINFORCED POLYMER PRODUCT, METHOD FOR MANUFACTURING A REINFORCED POLYMER PRODUCT OF THIS TYPE AND A PLASTIC COMPOUND SUITABLE FOR PRODUCING SUCH A REINFORCED POLYMER PRODUCT

Anne K. van der Vegt, Delft, Netherlands, assignor to Trchnische (Rijks) Hogeschool, Delft, Netherlands

Filed Jul. 11, 1983, Ser. No. 512,768
Claims priority, application Netherlands, Jul. 12, 1982, 82 02813
Int. Cl.[4] C08L 23/06, 23/12, 33/22, 68/00
U.S. Cl. 525—184 5 Claims

1. A reinforced polymer product produced by extrusion or injection molding melted plastics through a nozzle, said product comprising a thermoplastic basic polymer and reinforcing fibrous polymer elements which comprise oblong elements of a reinforcing polymer more stongly orientated and crystallized than the basic polymer, said elements at least being molecularly oriented during the molding of the polymer product by conveying the plasticized basic polymer surrounding the still melted elements of the reinforcing polymer at a temperature of at most 10° C. above the melting point of the reinforcing polymer while passing through the nozzle so that the elements of the reinforcing polymer are able to crystallize at a temperature near the melting point of the reinforcing polymer while surrounded by the still melted basic polymer, the articles as moulded comprising 10–70% by volume of the reinforcing polymers.

2. A reinforced polymer product as claimed in claim 1, wherein the oblong elements consist of a crosslinked polymer.

4,692,496

FILMS OF LLDPE, PP AND EPR HAVING IMPROVED STIFFNESS, TEAR AND IMPACT STRENGTH

Surinder K. Bahl, Chandigarh, India; Peter J. Canterino, Towaco, and Richard G. Shaw, Piscataway, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 568,014, Jan. 4, 1984, Pat. No. 4,565,847. This application Jan. 21, 1986, Ser. No. 821,086
The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.
Int. Cl.[4] C08L 23/18, 23/16, 23/12
U.S. Cl. 525—240 9 Claims

1. A film of thermoplastic blend comprising:

60 to 95 weight percent of a linear low density copolymer of ethylene and an olefin having 4 to 10 carbon atoms (LLDPE);

2 to 30 weight percent of a propylene polymer selected from the group consisting of polypropylene (PP) or propylene-ethylene copolymer with a high propylene content; and

less than 2 weight percent of a ethylene-propylene rubber (EPR) in an amount sufficient to improve the MD tear strength and the dart drop impact strength of the LLDPE/PP blend by at least 10 percent.

4,692,497

PROCESS FOR CURING A POLYMER AND PRODUCT THEREOF

Paul M. Gendreau, Swansea; Francisco M. Llort, Dighton, both of Mass., and Raymond A. Berard, Portsmouth, R.I., assignors to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 646,853, Sep. 4, 1984, Pat. No. 4,546,980. This application Jun. 27, 1985, Ser. No. 749,434
Int. Cl.[4] C08L 19/00, 9/00; C08K 5/09, 5/14
U.S. Cl. 525—263 13 Claims

1. In the method of making a product from an admixture of

a polymer formed from a diene monomer at least a portion of which is polybutadiene and a metal salt of an alpha, beta ethylenically unsaturated carboxylic acid having 3 to 8 carbon atoms the improvement comprising the use of at least two free radical initiators, one of the free radical initiators having a half life which is at least three times greater than the half life of another of the free radical initiators at 320° F. the two free radical initiators being present in the amount of from about 0.2 to about 10 parts by weight of the polymer content and being present in a ratio of from about 1:9 to about 9:1.

4,692,498

NOVEL RUBBER-MODIFIED THERMOPLASTIC RESIN COMPOSITIONS

Christopher L. Bodolus, Cleveland, Ohio, and David A. Woodhead, S. Glamorgan, Wales, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 535,726, Sep. 26, 1983, Pat. No. 4,542,189. This application Aug. 5, 1985, Ser. No. 762,311

Int. Cl.⁴ C08F *279/02, 255/06, 283/06*

U.S. Cl. 525—285 **18 Claims**

1. A process for the preparation of novel rubber modified thermoplastic resin compositions in a reactor, capable of intimately mixing multiple immiscible phases, comprising the steps of:

dissolving a rubber polymer in a monomer selected from the group consisting of monovinyl aromatic monomers, olefinically unsaturated nitriles and mixtures thereof to form a feed solution;

introducing said feed solution into a rector;

introducing into said reactor a separate liquid monomer feed stream said monomers being selected from the group consisting of unsaturated dicarboxylic acid anhydrides, olefinically unsaturated nitriles and mixtures thereof;

heating said feed solution and feed stream under pressure to a temperature sufficient for polymerization to begin; and

intimately mixing and polymerizing said monomers around said rubber polymer in said reactor to form a thermoplastic resin composition having a composition comprising:

from about 43 to about 75 parts by weight derived from a monovinyl aromatic monomer;

from about 20 to about 40 parts by weight derived from an olefinically unsaturated nitrile monomer; and

from about five to about 35 parts by weight derived from an unsaturated dicarboxylic acid anhydride monomer, providing 100 parts of a thermoplastic terpolymer; and

from about two to 30 parts of a rubber polymer per 100 parts of said thermoplastic terpolymer.

4,692,499

UNIQUE EPOXY RESIN COMPOSITIONS AND COMPOSITE MOLDED BODIES FILLED THEREWITH

Kevork A. Torossian; Mark Markovitz, both of Schenectady, and Frederick E. Cox, Gloversville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 595,599, Apr. 2, 1984, Pat. No. 4,631,230. This application May 15, 1986, Ser. No. 863,643

Int. Cl.⁴ C08L *63/00*

U.S. Cl. 525—524 **3 Claims**

1. A thermosetting resin composition having an unique combination of properties and consequent special utility in the production of electrical insulation in the form of composite molded bodies, said composition consisting essentially of an epoxy resin mixture of 25–75% of 1,2 epoxy resin having at least two epoxide groups per molecule and 75–25% of a polyglycol diepoxide having viscosity from 2,000–5,000 cps at 25° C., and small but effective amounts of both a phenolic accelerator and a catalytic hardener which is an organic titanate having only titanium-to-oxygen primary valence bonds.

4,692,500

POLYSULFIDE MODIFIED EPOXY RESINS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1986, Ser. No. 882,641

Int. Cl.⁴ C08F *283/10*

U.S. Cl. 525—529 **28 Claims**

1. A polysulfide modified epoxy resin composition comprising the copolymerization product of an epoxy resin, a (vinylaryl)alkyl substituted polysulfide, and a polymerizable ethylenically unsaturated compound.

4,692,501

PROCESS FOR CONTINUOUS MULTI-STAGE POLYMERIZATION OF OLEFINS

Hideo Mineshima; Haruyuki Koda, both of Ohtake, and Ryoichi Yamamoto, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 556,899, Dec. 1, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,330

Claims priority, application Japan, Feb. 6, 1982, 57-92999

Int. Cl.⁴ C08F *2/14, 6/24*

U.S. Cl. 526—65 **9 Claims**

1. In a process for producing an olefin polymer which comprises continuously polymerizing an olefin in the presence of a catalyst composed of a transition metal compound component and a organometallic compound component in at least two independent polymerization zones connected in series by a pipeline while feeding the olefin and the catalyst into an upstream zone of polymerization and withdrawing the resulting polymer from a downstream zone of polymerization; the improvement wherein

(1) the polymerization in the upstream polymerization zone is carried out in a liquid medium selected from the group consisting of liquid olefins and inert hydrocarbons having 3 to 10 carbon atoms under conditions for slurry polymerization,

(2) a solid polymer-containing slurry is discharged from the upstream polymerization zone and is fed into a liquid medium exchanging zone through an upper feed opening (A) in the upper portion thereof, said liquid medium exchanging zone being provided between the upstream polymerization zone and the downstream polymerization zone and connected to these zones by pipelines, and an additional supply of liquid medium selected from the group consisting of liquid olefins and inert hydrocarbons having 3 to 10 carbons atoms is fed into said exchanging zone through a lower feed opening (B) in the lower portion of said exchanging zone,

(3) a discharge flow from an upper discharge opening (C) in the exchanging zone above the upper feed opening (A) is recycled to the upstream polymerization zone, and a discharge flow from a bottom discharge opening (D) in the exchanging zone below the lower feed opening (B) is fed into the downstream polymerization zone, and

(4) the amount of the liquid medium in the discharge flow from the bottom discharge opening (D) is adjusted to 1 to 1.5 times the volume of the additional liquid medium fed from the lower feed opening (B), and thus a precipitated solid polymer is discharged from the bottom discharge opening (D) while the same is concurrent with, and in contact with, the liquid medium from the lower feed opening (B).

4,692,502

POLYMERIZATION PROCESS FOR CARBOXYL CONTAINING POLYMERS UTILIZING OIL SOLUBLE IONIC SURFACE ACTIVE AGENTS

Curtis E. Uebele, Bedford; Lawrence E. Ball, Akron; Richard J. Jorkasky, II, Maple Heights, and Eddie Wardlow, Jr., Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 9, 1986, Ser. No. 872,065
Int. Cl.[4] C08F *2/08, 2/26, 2/28*
U.S. Cl. 526—193 **20 Claims**

1. A method for polymerizing olefinically unsaturated carboxylic acid monomers containing at least one activated carbon to carbon olefinic double bond and at least one carboxyl group, wherein the monomers are polymerized in an organic media consisting essentially of organic liquids, in the presence of free radical forming catalysts and at least one oil soluble ionic surface active agent selected from the group consisting of:

(a) anionic surface active agents of the formula:

$$[(R\text{-}R_a')_b\text{-}X]^-M^+$$

(b) cationic surface active agents of the formula:

$$[(R\text{-}R_a')_xNR_y]^+A^-$$

and

(c) amphoteric surface active agents of the formula:

$$(R\text{—}R_a')_m\text{—}N^+\text{—}(CR_2)_c\text{—}X^-$$

$$R_n$$

wherein

R is a hydrophobic moiety having eight or more carbons,
R′ is a hydrophilic moiety,
R″ is each independently hydrogen, an alkyl group, an aryl group or an alkyl/aryl group,
X^- is a carbonate, sulfonate, sulfate or phosphate group,
M^+ is a water soluble cation,
A^- is a water soluble anion,
a is 0, 1, 2, 3, 4, 5, 6, 7 or 8,
b is 0, 1, 2 or 3,
c is 1, 2, 3, 4, 5, 6, 7 or 8
x and y are each 0, 1, 2, 3 or 4 with the proviso that $x+y=4$, and
m and n are each 0, 1, 2 or 3 with the proviso that $m+n=3$.

4,692,503

COATING COMPOSITIONS COMPRISING FREE RADICAL ADDITION POLYMERS WITH CROSSLINKABLE INTEGRAL ISOCYANATO GROUPS

Suryya K. Das, Pittsburgh, and Charles M. Kania, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 220,620, Dec. 29, 1980, abandoned. This application May 13, 1983, Ser. No. 493,045
Int. Cl.[4] C08F *12/26*
U.S. Cl. 526—301 **2 Claims**

1. A coating composition comprising an acrylic polymer which is prepared by polymerizing under free radical polymerization conditions a mixture of monomers comprising:

(A) from about 5 to about 50 percent by weight of a polymerizable ethylenically unsaturated amino group-containing monomer which is an amino group-containing acrylate or methacrylate, or amino group-containing heterocyclic compound having a hetero-nitrogen atom bearing a vinyl group and/or a polymerizable ethylenically unsaturated carboxylic acid group-containing monomer which is an acrylic acid, methacrylic acid, itaconic acid, crotonic acid, fumaric acid or maleic acid; the amino or carboxyl acid group is at least partially neutralized with an acid or a base;

(B) from about 5 to 85 percent by weight of a polymerizable ethylenically unsaturated blocked monoisocyanato group-containing monomer which is a blocked 2-isocyantoalkyl ester of acrylic or methacrylic acid,

(C) from about 5 to 90 percent by weight of a polymerizable ethylenically unsaturated hydroxyl group-containing monomer which is a hydroxyalkyl acrylate or hydroxalkyl methacrylate; and

(D) from about 0 to 85 percent by weight of at least one polymerizable ethylenically unsaturated monomer different from (a), (b) and (c) which is an alkyl acrylate or methacrylate or styrene; the percent by weight is based on the total weight of the monomers.

4,692,504

DEACTIVATION OF PHOSPHONIUM SALT CATALYST

Harry Frank, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 30, 1986, Ser. No. 858,311
Int. Cl.[4] C08G *59/68*
U.S. Cl. 528—89 **17 Claims**

1. A process for deactivating a hydrocarbyl phosphonium salt catalyst comprising contacting the catalyst with a sulfonic acid.

10. A process for preparing an advanced epoxy resin, the process comprising:

contacting in a reaction mixture a polyepoxide having an average of more than one vincinal epoxide group per molecule and a weight per epoxide less than about 500 with a fusion compound selected from the group consisting of phenols, thiophenols, carboxylic acids and carboxylic acid anhydrides in the presence of a catalytic amount of a hydrocarbyl phosphonium salt catalyst, at a temperature in the range of about 100° C. to about 200° C., for a time sufficient to produce an epoxy resin having a weight per epoxide of at least about 500; and

thereafter, adding to the reaction mixture an amount of a sulfonic acid effective to reduce the activity of the hydrocarbyl phosphonium salt catalyst.

4,692,505

PROCESS FOR PREPARING OXYMETHYLENE POLYMERS USING BORON TRIFLUORIDE IN ADMIXTURE WITH AN INERT GAS

Clifford R. Boldt, Corpus Christi, Tex., and Richard K. Greene, Kenet Square, Pa., assignors to Celanese Engineering Resins, Inc., Chatham, N.J.

Filed Jul. 22, 1986, Ser. No. 888,809
Int. Cl.[4] C08G *2/10*
U.S. Cl. 528—241 **10 Claims**

1. In a process for producing oxymethylene polymers by continuously polymerizing in bulk a monomer mixture containing at least 85 weight percent trioxane in the presence of a boron trifluoride catalyst, the improvement which comprises introducing into the reactor containing a monomer mixture the boron trifluoride catalyst as a gas in admixture with gaseous nitrogen in the volume ratio of nitrogen to boron trifluoride of about 5:1 to about 40:1.

4,692,506

FIVE-COMPONENT COPOLYESTER, PROCESS FOR PREPARATION THEREOF, AND SHAPED ARTICLES THEREOF

Tadao Yatsu, Iwakuni; Takayuki Nakano, Ohtake; Nobuya Hinooka, and Tatsuo Kato, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 675,189, Nov. 27, 1984, Pat. No. 4,622,268. This application Jul. 23, 1986, Ser. No. 888,476
Claims priority, application Japan, Nov. 28, 1983, 58-222182
Int. Cl.[4] C08G *63/12*
U.S. Cl. 528—296 **7 Claims**

1. A five-component copolyester composed of the following

components (a) to (d) and having the following characteristics (e) and (f):

(a) 25 to 45 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of two aromatic dicarboxylic acid components composed of 70 to 90 mole % of an isophthalic acid component and 30 to 10 mole % of an aromatic dicarboxylic acid component other than the isophthalic acid component, each based on the total moles of the two aromatic dicarboxylic acid components,

(b) 45 to 50 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of a diol component composed of 50 to 100 mole % of an ethylene glycol component and 0 to 50 mole % of a diol component other than the ethylene glycol component, each based on the total moles of the two diol components,

(c) 2 to 25 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of an aromatic monohydroxy-monocarboxylic acid component having 7 to 12 carbon atoms, and

(d) 0.01 to 2 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of a polyfunctional compound component having 3 to 15 carbon atoms and at least three functional groups selected from the class consisting of carboxyl and hydroxyl groups; and

(e) an intrinsic viscosity [η]. determined at 25° C. in a mixed solvent of phenol and tetrachloroethane in a weight ratio of 1:1, of 0.5 to 1.5 dl/g, and

(f) a glass transition temperature of 50° to 120° C.

4,692,507

PROPYLENE-BASE RANDOM COPOLYMER PARTICLES AND PRODUCTION PROCESS THEREOF

Hiroyuki Akiyama, Hiratsuka; Susumu Izawa, Utsunomiya, and Hideki Kuwabara, Hadano, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Division of Ser. No. 795,431, Nov. 6, 1985, Pat. No. 4,602,082. This application Apr. 16, 1986, Ser. No. 852,574
Claims priority, application Japan, Mar. 20, 1985, 60-57454
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—481 **5 Claims**

1. Propylene-base random copolymer particles suitable for use in the production of pre-foamed particles, characterized in that said copolymer particles have been heated to the crystallization temperature thereof or higher and then quenched in an atmosphere of temperature of (the crystallization temperature—30° C.) or lower and are columnar particles made of an ethylene-propylene random copolymer resin and having an average diameter D of 1.7 mm or less and an average length L which has the following relation with the average diameter D:

$$L/D \geqq 1.$$

4,692,508

VINYLIDENE CHLORIDE INTERPOLYMER POSSESSING IMPROVED EXTRUDABILITY

Mark J. Hall, and Kun S. Hyun, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 20, 1985, Ser. No. 811,214
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—503 **9 Claims**

1. A process for improving the extrudability of a vinylidene chloride interpolymer, said vinylidene chloride interpolymer being formed from a monomer mixture comprising at least 40 weight percent vinylidene chloride and being in the form of pellets, said vinylidene chloride interpolymer pellets displaying a first endotherm, as determined by differential scanning calorimetry according to American Society for Testing and Materials Test Method D-3417, below 75° Celsius, wherein the process comprises: exposing said vinylidene chloride interpolymer pellets to a temperature above about 55° Celsius for a length of time sufficient to raise said first endotherm to 75° Celsius or above.

4,692,509

RADIOACTIVE LABELING OF PROTEINS WITH NUCLEOSIDES OR NUCLEOTIDES

Nanibhushan Dattagupta, New Haven, Conn., assignor to Molecular Diagnostics, Inc., West Haven, Conn.

Filed Nov. 27, 1984, Ser. No. 675,373
Int. Cl.[4] A61K *43/00*; A61N *5/12*
U.S. Cl. 530—303 **12 Claims**

1. A radioactively labeled protein comprising a protein, and a radioactive nucloeside or nucleotide, wherein a radioactive moiety is present in the nucleoside or nucleotide, the protein being convalently linked to the nucleoside or nucleotide.

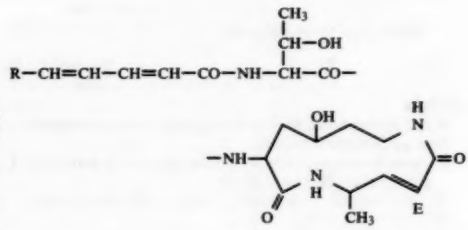
4,692,510

PEPTIDE ANTIBIOTICS

Masataka Konishi, Kawasaki; Koji Tomita, Setagaya; Masahisa Oka, Yokohama, and Ken-ichi Numata, Fuchu, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 771,090, Aug. 30, 1985, abandoned. This application Apr. 25, 1986, Ser. No. 855,649
Int. Cl.[4] C07K *5/12*; C07D *210/00*
U.S. Cl. 530—317 **4 Claims**

1. Compounds of the formula



wherein R is $CH_3—(CH_2)_6$, $CH_3—(CH_2)_4—CH=CH—(CH_2)_2$ or $CH_3—(CH_2)_8$.

4,692,511

PEPTIDE ANTAGONISTS FOR THE C5A ANAPHYLATOXIN

Gary S. Hahn, San Diego, Calif., assignor to Immunetech Pharmaceuticals, San Diego, Calif.

Filed Jul. 3, 1984, Ser. No. 627,702
Int. Cl.[4] C07K *5/08, 5/10, 7/06, 7/08, 7/10*
U.S. Cl. 530—325 **16 Claims**

1. A peptide antagonist for C5a activity, said peptide having an amino acid sequence A-B-C-R-D-E-F wherein:

A is an amino-terminal hydrogen or an amino acid or polypeptide selected from the following list:

Lys—His—Ser—Val—Val—Lys—Lys—
His—Ser—Val—Val—Lys—Lys—
Ser—Val—Val—Lys—Lys—
Val—Val—Lys—Lys—
Val—Lys—Lys—
Lys—Lys—
Lys—;

B is said amino-terminal hydrogen or an amino acid selected from the following list:
Cys
or
Ser;

C is said amino-terminal hydrogen or an amino acid selected from the following list:

Cys
or
Ser

R is a "core" tetrapeptide:
Tyr-Asp-Gly-Ala or Asp-Gly-Ala-Tyr
or a "core" tripeptide:
Asp-Gly-Ala;

D is a carboxy-terminal hydroxyl or an amino acid selected from the following list:
Cys
Ser
or
Tyr;

E is said carboxy-terminal hydroxyl or an amino acid selected from the following list:
Val
or
Arg;

F is said carboxy-terminal hydroxyl or an amino acid or polypeptide selected from the following list:
Asn-Asn-Asp-Glu-Thr-Cys-Glu-Gln-Arg
Asn-Asn-Asp-Glu-Thr-Cys-Glu-Gln
Asn-Asn-Asp-Glu-Thr-Cys-Glu
Asn-Asn-Asp-Glu-Thr-Cys
Asn-Asn-Asp-Glu-Thr
Asn-Asn-Asp-Glu
Asn-Asn-Asp
Asn-Asn
Asn

and polypeptides identical to the first four listed in which Ser is substituted for Cys; and wherein the above amino acids and polypeptides are composed of L-enantiomeric amino acids.

4,692,512

ALPHA-L-ASPARTYL-D-PHENYLGLYCINE ESTERS AND AMIDES USEFUL AS HIGH INTENSITY SWEETENERS

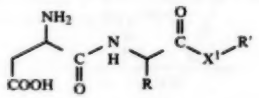
John M. Janusz, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 630,504, Jul. 13, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 811,585

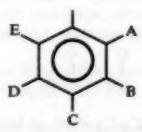
Int. Cl.[4] A23L *1/236*

U.S. Cl. 530—801 **22 Claims**

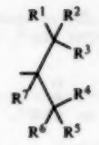
1. A compound of formula:



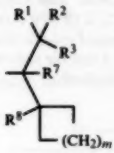
wherein the said ester or amide is the L, D stereochemical isomer; wherein X^1 is O or NH; and wherein R is a phenyl group having the formula:



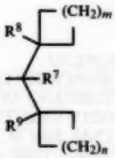
wherein, A, B, C, D and E are H, OH, F, Cl, Br, or C_1–C_4 alkyl, hydroxyalkyl or alkoxy; and wherein R' is selected from the group consisting of hydrocarbyl radicals having formulas (a) (b) (c) (d) (e) (f) and (g):



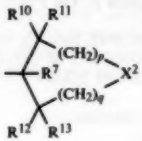
(a)



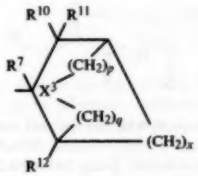
(b)



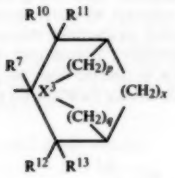
(c)



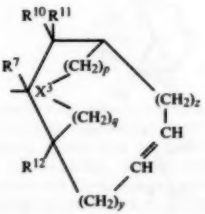
(d)



(e)

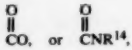


(f)

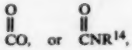


(g)

wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} are H, or C_1–C_4 alkyl, hydroxyalkyl or alkoxy; X^2 is CH_2, O, S, SO, SO_2, C=O, $CR^{14}OH$, NR^{14}



wherein R^{14} is H or C_1–C_2 alkyl or hydroxyalkyl; X^3 is CH_2, O, S, SO, SO_2, C=O, $CR^{14}OH$, NR^{14},



provided that when X^3 is other than CH_2, R^{10}, R^{11}, R^{12} and R^{13} are each H; m is 0, 1, 2, 3, or 4; n is 0, 1, 2, 3, or 4; p and q are 0. 1, 2 or 3 and the sum of p+q is not greater than 3; x is 1, 2 or 3; y and z are 0, 1 or 2 and the sum of y+z is not greater than 2; and nontoxic salts thereof.

4,692,513

ALPHA-L-ASPARTYL-D-HETEROAROMATIC-SUBSTITUTED GLYCINE ESTERS AND AMIDES USEFUL AS HIGH INTENSITY SWEETENERS

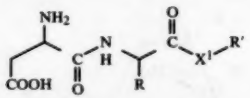
Robert B. Blum, Santiago, Chile; John M. Gardlik, Cincinnati, Ohio; John M. Janusz, Fairfield, Ohio, and George P. Rizzi, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1985, Ser. No. 811,609

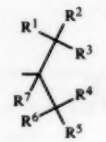
Int. Cl.[4] **C07D** *271/02, 285/06, 285/08, 285/12, 331/02, 333/02, 251/00, 213/00*

U.S. Cl. 530—801 **23 Claims**

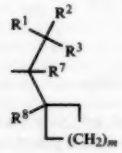
1. A compound of the formula:



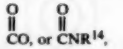
and nontoxic salts thereof; wherein the said ester or amide is the L,D stereochemical isomer; wherein X^1 is O or NH; and wherein R is a heteroaromatic group having a 5 or 6 member heteroaromatic ring selected from the group consisting of furyl, thienyl, pyrryl, oxazolyl, thiazolyl, imidazolyl, isoxazolyl, isothiazolyl, pyrazolyl, oxadiazolyl, thiadiazolyl, triazolyl, tetrazolyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl and triazinyl; and wherein R' is selected from the group consisting of hydrocarbyl radicals having formulas (a) (b) (c) (d) (e) (f) and (g):



(a) wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} are H, or C_1–C_4 alkyl, hydroxyalkyl or alkoxy; X^2 is CH_2, O, S, SO, SO_2, C=O, $CR^{14}OH$, NR^{14}

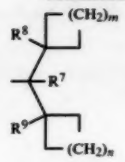


(b)

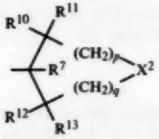


wherein R^{14} is H or C_1–C_2 alkyl or hydroxyalkyl; provided that when R^1 is a hydrocarbyl radical of formal (e), (f) or (g), R^{10}, R^{11}, R^{12} and R^{13} are each H when X^2 is other than CH_2 or O; m is 0, 1, 2, 3 or 4; n is 0, 1, 2, 3, or 4; p and q are 0, 1, 2 or 3 and the sum of p+q is not greater than 3; x is 1, 2 or 3; y and z are 0, 1 or 2 and the sum of y+z is not greater than 2.

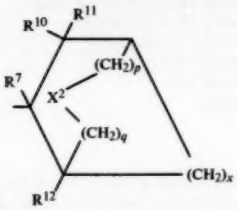
-continued



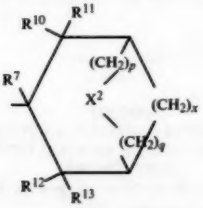
(c)



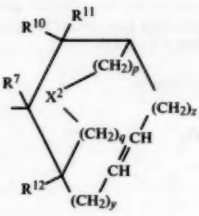
(d)



(e)



(f)



(g)

4,692,514

PROCESS FOR SEPARATING KETOSES FROM ALKALINE- OR PYRIDINE-CATALYZED ISOMERIZATION PRODUCTS

Chin-Hsiung Chang, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 20, 1985, Ser. No. 811,588
Int. Cl.[4] C07H *1/00*
U.S. Cl. 536—127 **7 Claims**

1. A process for separating psicose from an aqueous feed mixture containing psicose and at least one other ketose selected from the group consisting of fructose, sorbose, tagatose and ribulose, which comprises contacting at adsorption conditions said mixture with an adsorbent comprising a type Y zeolite having calcium cations at exchangeable cationic sites, selectively adsorbing said psicose to the substantial exclusion of said other ketoses, removing the nonadsorbed portion of the feed mixture from contact with the adsorbent, and thereafter recovering high purity psicose by desorption at desorption conditions.

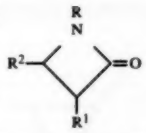
4,692,515

ADAMANTANE-SPIROLACTAMS

Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 653,632, Sep. 24, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 874,917
Int. Cl.[4] C07D *205/12*; A61K *31/395*
U.S. Cl. 540—203 **16 Claims**

1. A spiro[azetidin-2-one-4,2'(or 3,2')adamantane] compound having the following structure:



where R is hydrogen, —SO_2Cl, or an alkyl group and one of R^1 and R^2 is an adamantyl group which shares a ring carbon with the lactam moiety and the other is an alkyl, a hydroxy substituted alkyl, a phenyl, or a phenyl group substituted with a haloalkyl, alkoxy or formyl radical, said alkyl groups having from 1 to 8 carbon atoms.

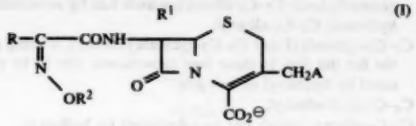
4,692,516

PROCESS FOR THE MANUFACTURE OF 3-PYRIDINIUM-METHYL-CEPHALOSPORINS

Reiner Kirrstetter, Kelkheim; Walter Dürckheimer, Hattersheim am Main; Rudolf Lattrell, Königstein/Taunus, and Wilfried Schwab, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

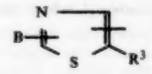
Filed May 7, 1984, Ser. No. 607,593
Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316797
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[4] C07D *501/46*
U.S. Cl. 540—222 **2 Claims**

1. A process for the preparation of a cephem compound of the formula I

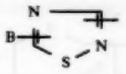


(I)

in which R denotes a thiazolyl radical



or a 1,2,4-thiadiazolyl radical

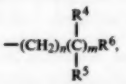


in which

R^3 represents hydrogen or halogen and B represents an amino group or an amino group substituted with an amino protective group, and wherein

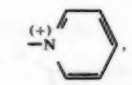
R^1 denotes hydrogen,

R^2 denotes hydrogen, C_1–C_6-alkyl, which can be mono-substituted or polysubstituted by halogen, C_1–C_6-alkylthio, C_1–C_6-alkoxy, phenyl or 1,3-thiazol-4-yl or denotes C_2–C_6-alkenyl, which can be monosubstituted or polysubstituted by halogen; or denotes C_2–C_3-alkynyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_6-alkyl, C_4–C_7-cycloalkenyl, or the group



in which m and n are each 0 or 1,

R^4 and R^5 can be identical or different and denote hydrogen, phenyl or a C_1–C_4-alkyl group, or, together with the carbon to which they are bonded, form a methylene or C_3–C_7-cycloalkylidene group, R^6 denotes a COOH, CN or $CONH_2$ group, it being possible for the latter to be monosubstituted or disubstituted on the nitrogen by methyl or ethyl, A denoes a quinolinium or isoquinolinium radical, each of which can also be monosubstituted or polysubstituted by identical or different substituents from the group comprising C_1–C_6-alkyl, which can be substituted by hydroxyl; halogen, trifluoromethyl and
hydroxyl,
or denotes a pyridinium radical



which can be monosubstituted or polysubstituted by identical or different substituents from the group comprising C_1–C_6-alkyl, which can be monosubstituted or polysubstituted by hydroxyl; formyl and C_1–C_6-alkylcarbonyl, sulfo, carbamoyl, C_1–C_6-alkoxy and hydroxy-C_1–C_6-alkoxy, it also being possible for 2 neighbouring alkyl groups to be linked to form a tri- to pentamethylene ring in which one ring carbon atom can be replaced by an oxygen or sulfur atom and which can furthermore also contain one or two double bonds, and which may be substituted by C_1–C_6-alkyl,

C_1–C_4-alkoxy, hydroxymethyl, halogen, hydroxyl, oxo or exomethylene, C_2–C_6-alkenyl, which can be substituted by hydroxyl, C_2–C_6-alkynyl,

C_3–C_7-cycloalkyl and C_3–C_7-cycloalkylmethyl, it being possible for the ring in these two substituents also to be substituted by hydroxyl or halogen,

C_4–C_7-cycloalkenyl,

C_1–C_6-alkoxy, which can be substituted by hydroxyl,

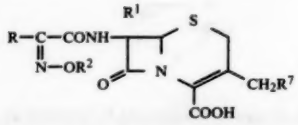
C_2–C_6-alkenyloxy and C_2–C_6-alkynyloxy,

halogen, trifluoromethyl and hydroxyl; phenyl, benzyl which can also be substituted by halogen, 2'-thienyl or 3'-thienyl, formyl, C_1–C_6-alkylcarbonyl, which can also be substituted by hydroxyl,

phenylcarbonyl and

carbamoyl,

and in which the R^2O group is in the syn-position, which comprises reacting a compound of the formula II



(II)

or salts thereof, in which R, R^1 and R^2 have the meaning given for formula I and R^7 denotes a group which can be replaced by the base corresponding to the radicals A of formula I, with a molar excess of this base in the presence of a tri-C_1–C_4-alkyliodosilane to form a compound of the formula I and said base is also present in molar excess related to said tri-C_1–C_4-alkyliodosilane and

(a) splitting off any protective group present and

(b) if necessary, converting the resulting product into a physiologically acceptable acid addition salt.

4,692,517

C-3' ACYLAMINOOXY-7-[(2-AMINOTHIAZOL-4-YL)-α-(SUBSTITUTED-OXIMINO)ACETYL]CEPHALOSPORIN DERIVATIVES

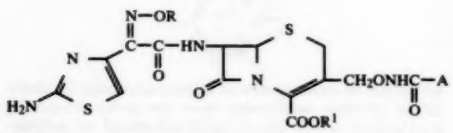
Jerauld S. Skotnicki, Chadds Ford, and Thomas J. Commons, Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 20, 1986, Ser. No. 842,123

Int. Cl.[4] C07D *501/34*

U.S. Cl. 540—222 **2 Claims**

1. A compound having the formula



wherein

R is hydrogen, lower alkyl, or cyclo lower alkyl, the said foregoing groups being optionally substituted with carboxy or lower alkoxycarbonyl;

R^1 is hydrogen, lower alkyl or an alkali metal cation; and

A is lower alkoxy or aryloxy of 6–10 carbon atoms.

4,692,518

CRYSTALLINE (7R)-7-AMINO-3-(1'-PYRIDINIUMMETHYL)-3-CEPHEM-4-CARBOXYLATE MONOHYDRATE COMPOUND

Gary E. Lord, West Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 6, 1985, Ser. No. 795,568

Int. Cl.[4] C07D *501/38*; A61K *31/44*

U.S. Cl. 540—224 **1 Claim**

1. The crystalline monohydrate of 7-(R)-amino-3-(1'-pyridiniummethyl)-3-cephem-4-carboxylate which has the following X-ray powder diffraction obtained with nickel-filtered copper radiation of λ = 1.5418 angstroms, wherein d represents the interplanar spacing and I/I_1 the relative intensity:

d	I/I_1
10.49	.06
7.85	.32
7.27	.06
6.93	.24 b
6.14	.30
5.33	.20
5.00	.56
4.79	.12
4.30	1.00
4.03	.28
3.92	.14
3.85	.14
3.62	.82
3.50	.60
3.37	.26
3.16	.08
3.09	.02
3.03	.08
2.95	.02
2.83	.06 b
2.66	.26
2.61	.06 b
2.49	.20
2.42	.06
2.35	.02
2.27	.12
2.15	.12
2.09	.14
1.927	.02
1.891	.02
1.874	.02.

4,692,519

CRYSTALS OF SODIUM CEPHEMCARBOXYLATE

Kenzo Naito, Kyoto; Kazuo Tsukamura, Hyogo, and Sakae Aoyagi, Saitama, all of Japan, assignors to Lederle (Japan), Ltd., Kyobashi and Takeda Chemical Industries, Ltd., Jusohonmachi, both of, Japan

Filed Nov. 26, 1984, Ser. No. 674,745

Claims priority, application Japan, Dec. 2, 1983, 58-228868

Int. Cl.[4] C07D *501/56*; A61K *31/545*

U.S. Cl. 540—227 **1 Claim**

1. Crystals of sodium 7β-[2-(2-aminothiazol-4-yl)-(Z)-2-methoxyiminoacetamido]-3-[(1,2,3-thiadiazol-5-yl)thiomethyl]ceph-3-em-4-carboxylate showing their characteristic peaks at interplanar spacings (d) of 9.3, 8.9, 5.3, 5.1, 4.4, 4.3, and 3.89 Å in the powder X-ray diffraction pattern.

4,692,520

N-SUBSTITUTED ACYL-LACTAM COMPOUND

Albert A. Van Geenen, Brunssum, and Jozef J. M. Bongers, Elsloo (L.), both of Netherlands, assignors to Stamicarbon B.V. (Subsidiary of DSM), Geleen, Netherlands

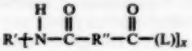
Filed Dec. 13, 1985, Ser. No. 808,559

Claims priority, application Netherlands, Dec. 20, 1984, 8403860

Int. Cl.[4] C07D 223/10

U.S. Cl. 540—451 11 Claims

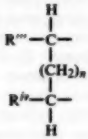
1. N-substituted acyl-lactam compound having the formula



wherein

R′ is a bivalent alkyl, aralkyl, alkaryl or aryl residue radical of a polyisocyanate,

R″ is a bivalent radical of a dicarboxylic acid anhydride having the following formula



wherein

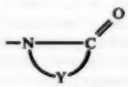
R‴ is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl,

R^{iv} is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl, where

R‴ and R^{iv}, together with the carbon atom to which each is bonded, may jointly form a cycloalkyl residue,

n is 0 or 1,

(L) represents a non-opened lactam ring having the formula



wherein

Y has 3–11 carbon atoms, and X is a number ≧ to 1.

4,692,521

N-SUBSTITUTED ACYL-LACTAM COMPOUND

Jozef J. M. Bongers, Elsloo, and Albert A. Van Geenen, Brunssum, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

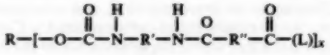
Filed Dec. 13, 1985, Ser. No. 808,558

Claims priority, application Netherlands, Dec. 20, 1984, 8403861

Int. Cl.[4] C07D 223/10

U.S. Cl. 540—451 11 Claims

1. N-substituted acyl-lactam compound, characterized by the formula:

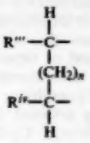


where

R is a residue originating from a polyol having the formula R—(OH)$_x$ where x is a number ≧2 and having an equivalent weight of at least 300 and up to 5,000;

R′ a bivalent cyclic or non-cyclic alkyl, aralkyl, alkaryl or aryl radical;

R″ a bivalent radical residue from a dicarboxylic acid, anhydride having the following formula



wherein

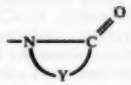
R‴ is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl,

R^{iv} is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl, where

R‴ and R^{iv} may jointly, together with the carbon atom to which is respectively bonded, form a substituted or unsubstituted cycloalkyl residue;

n is 0 or 1; and

(-L) represents a non-opened lactam ring of the formula



wherein Y has 3–11 carbon atoms.

5. The compound according to claim 1 wherein:

R′ is the bivalent radical residue of 1,5-hexane diisocyanate, 1,6 hexanediisocyanate, isophoronediisocyanate, toluenediisocyanate, MDI, hydrogenated MDI, modified MDI, xylylenediisocyanate and hydrogenated toluenediisocyanate;

R is a residue of a polyether polyol, a polyester polyol, a polybutadiene polyol, a siloxane-containing polyol(s), polymeric polyol(s), or mixtures thereof;

R″ is the bivalent radical residue of a dicarboxylic acid anhydride selected from the group consisting of glutaric acid anhydride, succinic acid anhydride, or 1,2 cyclohexane dicarboxylic acid anhydride; and

L represents a lactam ring wherein the lactam of said lactam ring is selected from the group consisting of 2-pyrrolidone, 2-piperidone, enantholactam, decanolactam, undecanalactam, lauryll lactam, caprolactam and mixtures thereof.

4,692,522

BENZOFUSED LACTAMS USEFUL AS CHOLECYSTOKININ ANTAGONISTS

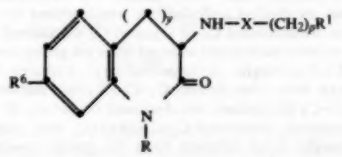
William H. Parsons, Rahway, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 718,597, Apr. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 624,856, Jun. 26, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 871,340

Int. Cl.[4] C07D 223/16, 225/06, 215/22

U.S. Cl. 540—523 3 Claims

1. A compound of the formula:



wherein:

X is absent or carbonyl;

R is unsubstituted or mono-, di-, or trisubstituted C$_1$–C$_8$-

straight- or branched-alkyl, where the substituent(s) is/are selected from the group consisting of C_1–C_4-alkylthio, C_1–C_4-alkyloxy, C_1–C_4-alkylamino, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryloxy, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10} -arylthio, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl, and unsubstituted or mono-, di-, or tri-substituted heteroaryl, and the substituent(s) on the C_6- or C_{10}-aryloxy, the C_6-or C_{10}-arylthio, the C_6- or C_{10}-aryl and the heteroaryl being selected from C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkyl-amino; substituted carbonyl-C_1–C_4-alkyl, which carbonyl group is substituted with hydroxy, C_1–C_8-straight- or branched-alkoxy, C_1–C_8-straight- or branched-alkyl, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-alkyl, and unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkoxy, where the substituent(s) on the C_6- or C_{10}-aryl, the C_6- or C_{10}-aryl-C_1–C_8-alkyl or the C_6- or C_{10}-aryl-C_1–C_4-alkoxy is/are selected from the group consisting of hydroxy, C_1–C_8-straight- or branched-alkyl, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio, and mono- or di-C_1–C_4-alkylamino, or NR_4R_5, where R_4 R_5 are independently selected from hydrogen, C_1–C_6-straight- or branched-alkyl, unsubstituted or mono-, di-, or trisubstituted-carboxy-C_1–C_8-straight- or branched-alkyl, or unsubstituted or mono-, di-, or trisubstituted-carboxamido-C_1–C_8-straight- or branched-alkyl, wherein the substituent(s) on the carboxy-C_1–C_8-straight- or branched-alkyl or on the carboxamido-C_1–C_8-straight- or branched-alkyl is/are selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, amino-C_1–C_4-alkyl, unsubstituted or mono-, di-, or trisubstituted C6- or C10-aryl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-alkyl, and unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkoxy, where the substituent(s) on the C_6- or C_{10}-aryl, the C_6- or C_{10}-aryl-C_1–C_8-alkyl or the C_6- or C_{10}-aryl-C_1–C_4-alkoxy is/are selected from the group consisting of hydroxy, C_1–C_8straight- or branched-alkyl, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio, and mono- or di-C_1–C_4-alkylamino;

R^1 is R^a or R^b;

R^a is unsubstituted or mono-, di- or trisubstituted aryl, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl, and the substitutent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-straight- or branched-alkyl, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl-C_1–C_8-straight- or branched-alkyl, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6-or C_{10}-aryl-C_2–C_4-alkenyl, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4 alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl-C_2–C_4-alkenyl, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryloxy, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkyl-thio and mono- or di- C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryloxy, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-arylthio, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkyl-thio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroarylthio, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkyloxy, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl-C_1–C_4-alkyloxy, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted mono- or C_{10}-aryl-C_1–C_4-alkylthio, where substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl-C_1–C_4-alkylthio, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; C_1–C_8-straight- or branched-alkyls; C_3–C_{10}-cycloalkyl; C_3–C_{10}-cycloalkyl-C_1–C_4-alkyl; C_1–C_6-straight- or branched-alkyl-Q-$(CH_2)_m$, here m is 1-to-3, and Q is O, S, SO, SO_2, —HC═CH–, or substituted-amino, wherein the substituent is hydrogen, C_1–C_8-straight- or branched-alkyl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl, unsubstituted or mono-, di or trisubstituted heteroaryl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkyl, or unsubstituted or mono-, di- or trisubstituted heteroaryl where the substituent(s) on the C_6- or C_{10}-aryl, the heteroaryl, the C_6- or C_{10}-aryl-C_1–C_4-alkyl, or the heteroaryl C_1–C_4-alkyl is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4alkoxy, halo, nitro, amino, C_1–C_4-alkyl-thio and mono- or di-C_1–C_4-alkylamino; or C_9–C_{12}-benzofused cycloalkyls; and

R^b is —CHR^2R^3, where R^2 is R^a, as defined above, and

R^3 is substituted carbonyl, wherein the substituent is hydroxy, C_1–C_4-alkoxy, C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, amino, C_1–C_8-straight- or branched-alkylamino, C_6- or C_{10}-aryloxy, C_6- or C_{10}-aryl-C_1–C_6-alkylamino, C_6- or C_{10}-aryl-C_1–C_4-alkyloxy, carboxy-C_1–C_8-straight- or branched-alkylamino, or carboxamido-C_1–C_8-straight- or branched-alkylamino; NR^7R^8 wherein R^7 and R^8 are independently selected from hydrogen, substituted carbonyl, unsubstituted or mono-, di- or trisubstituted-carboxy-C_1–C_8-straight- or branched-alkyl, and unsubstituted- or mono-, di- or trisubstituted-carboxamido-C_1–C_8-straight- or branched-alkyl, where the substituents on the carbonyl, the carboxy-C_1–C_8-alkyl or the carboxamido-C_1–C_8-alkyl is/are selected from C_1–C_4-alkyl, C_1–C_4-alkyloxy, amino-C_1–C_4-alkyl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-alkyl, unsubstituted- or mono-, di- or trisubstituted C_6- or C_{10}-aryl, unsubstituted- or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkoxy, and mono-, di- or trisubstituted-C_1–C_8-alkyl, wherein the

substituent(s) on the C_6- or C_{10}-aryl-C_1–C_8-alkyl, the C_6- or C_{10}-aryl, the C_6- or C_{10}-aryl-C_1–C_4-alkoxy or the C_1–C_8-alkyl is/are selected from hydroxy, C_1–C_8-straight- or branched-alkyl, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio, or mono- or di-C_1–C_4-alkylamino;

R^6 is hydrogen; halo; hydroxy; nitro; amino; C_1–C_4-alkylamino; C_1–C_8-alkyl; or C_1–C_8alkoxy;

y is 1 to 3;

p is 0 to 2, with the proviso that when p is 0, X is carbonyl; wherein heteroaryl represents a group selected from the group consisting of pyridyl, thienyl, furyl, imidazoyl, thiazolyl, indolyl, quinolinyl, isoquinolinyl, benzimidazolyl, benzothiazolyl, and benzthienyl; and the pharmaceutically-acceptable salts thereof.

4,692,523

PROCESS FOR THE PREPARATION OF 1-SUBSTITUTED AZA-CYCLOALKAN-2-ONES

Manfred Schorr, Frankfurt am Main, and Wilfried Schmitt, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

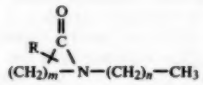
Filed Oct. 7, 1986, Ser. No. 916,373

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536028

Int. Cl.[4] C07D *207/267, 211/76, 223/10, 225/02*

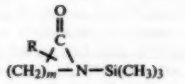
U.S. Cl. 540—533 **3 Claims**

1. A process for the preparation of 1-substituted azacycloalkan-2-ones of the formula I



I

in which R denotes hydrogen or lower alkyl having 1–4 carbon atoms, m denotes 3–7 and n denotes 0–17, which comprises reacting a 1-trimethylsilylazacycloalkan-2-one of the formula III



III

in which R and m have the above-mentioned meanings with an alkali metal alcoholate or an alkali metal oxide and, for the introduction of the alkyl radical $—(CH_2)_nCH_3$, reacting the alkali metal salt of the azacycloalkan-2-one thus formed with an alkylating agent.

4,692,524

PROCESS FOR THE PREPARATION OF PYRIMIDINE DERIVATIVES

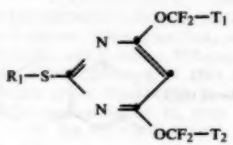
Robert Hässig, Sisseln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 2, 1986, Ser. No. 858,636

Int. Cl.[4] C07D *239/60, 239/56*

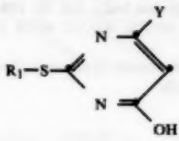
U.S. Cl. 544—303 **23 Claims**

1. A process for the preparation of a 2-mercapto-4,6-bis-fluoroalkoxypyrimidine of formula I



(I)

wherein R_1 is C_1–C_4alkyl, phenyl or benzyl and each of T_1 and T_2 independently of the other is hydrogen or a $—CHX_1X_2$ group, wherein each of X_1 and X_2 independently of the other is trifluoromethyl, fluorine, chlorine or bromine, which process comprises reacting a 2-mercapto-4-halo-6-hydroxypyrimidine of formula II

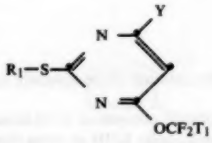


(II)

wherein R_1 is as defined for formula I and Y is chlorine or bromine, with chlorodifluoromethane or a 1,1-difluoroalkene of formula III

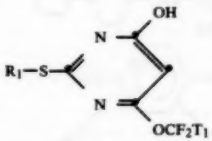
(III)

wherein each of X_1 and X_2 independently of the other is trifluoromethyl, fluorine, chlorine or bromine, in an inert solvent and in the presence of a strong base, to give a 2-mercapto-4-halo-6-fluoroalkoxypyrimidine of formula IV



(IV)

wherein R_1, Y and T_1 are as defined above, converting said 2-mercapto-4-halo-6-fluoroalkoxypyrimidine of formula IV by subsequent reaction with an alkali metal nitrite or an alkaline earth metal nitrite, in a polar solvent, into a 2-mercapto-4-hydroxy-6-fluoroalkoxypyrimidine of formula V



(V)

wherein R_1 and T_1 are as defined above, and then converting said 2-mercapto-4-hydroxy-6-fluoroalkoxypyrimidine of formula V by reaction with chlorodifluoromethane or a 1,1-difluoroalkene of formula III, in an inert solvent and in the presence of a strong base, into a 2-mercapto-4,6-bis-fluoroalkoxypyrimidine of formula I.

4,692,525

PROCESS FOR THE SEPARATION OF OPTICAL ISOMERS OF RACEMIC 1-PYRIDYL-ALKYL-4-ARYL PIPERAZINES, AND OPTICAL ISOMERS OBTAINED THEREBY

Graziano Bonacchi; Mauro Fedi, and Mario Giannini, all of Florence, Italy, assignors to Malesci S.p.A. Istituto Farmacobiologico, Florence, Italy

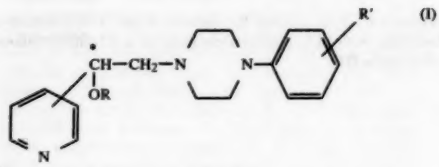
Division of Ser. No. 627,583, Jul. 3, 1984, Pat. No. 4,578,467. This application Dec. 11, 1985, Ser. No. 807,714

Claims priority, application Italy, Jul. 11, 1983, 48664 A/83

Int. Cl.[4] C07D *401/06, 401/12;* A61K *31/495*

U.S. Cl. 544—360 **7 Claims**

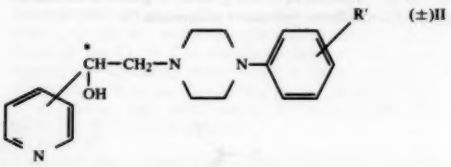
1. A process for the separation of the optical antipodes of the compound of the formula:



(I)

which process is characterized in that, according to the flowsheet C:

(a) the racemic alcoholic derivative corresponding to the formula:



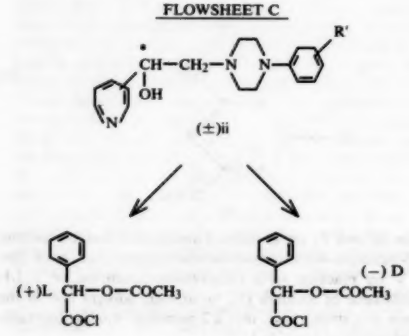
(±)II

is reacted with the chloride of the optically active acetylmandelic acid;

(b) the diastereoisomeric compound so obtained is hydrolyzed with hydroalcoholic KOH at room temperature;

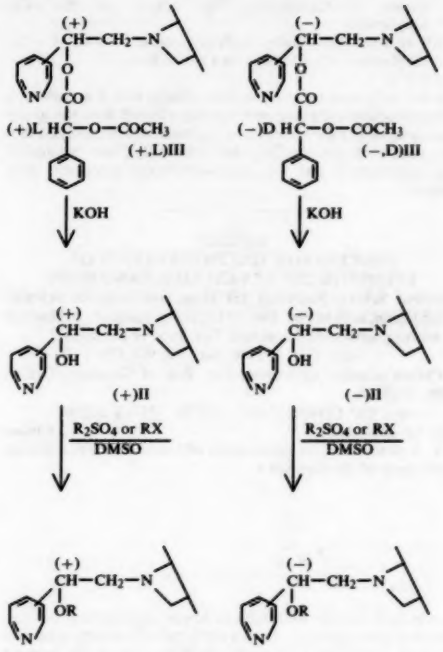
(c) the optically active alcoholic derivative so obtained, after salification with alkaline hydrides or hydrates in a solvent medium is treated with alkylating agents according to the following flowsheet:

FLOWSHEET C



-continued

FLOWSHEET C



4,692,526

PROCESS FOR PREPARING BENZOPYRANO (2,3-D) TRIAZOLES

Derek R. Buckle, and Stephen T. Carpenter, both of Redhill, England, assignors to Beecham Group PLC, Middlesex, England

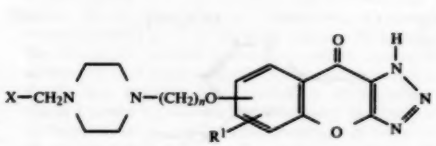
Filed Nov. 12, 1985, Ser. No. 797,111

Claims priority, application United Kingdom, Nov. 14, 1984, 8428742

Int. Cl.[4] C07D *413/00*

U.S. Cl. 544—366 **18 Claims**

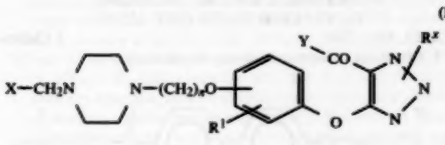
1. A process for preparing a compound of formula (I)



(I)

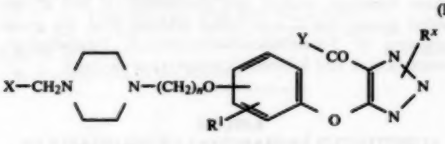
wherein X is phenyl optionally substituted by one halogen,

C_{1-4} alkyl or C_{1-4} alkoxy; or pyridyl; R_1 is hydrogen or C_{1-6} alkyl; and n is an integer of from 1 to 6;
which process comprises, cyclising a compound of formula (II):



wherein X, R^1 and n are as defined in relation to formula (I); Y is an hydroxy or an acid activating group and R^x is hydrogen or an N-protecting group and thereafter if desired carrying out one or more of the following steps: (i) removing any protecting group R^x, (ii) preparing a salt of the compound of formula (I).

17. A compound of formula II



wherein X is phenyl optionally substituted by one halogen, C_{1-4} alkyl or C_{1-4} alkoxy; or pyridyl; R^1 is hydrogen or C_{1-6} alkyl; n is an integer of from 1 to 6; COY is an acid, acid halide or anhydride and R^x is hydrogen or C_{2-6} alkoxy substituted benzyl group.

4,692,527

2-AMINO-3,5-DI-(HALOMETHYL)-PYRAZINES AND THEIR PREPARATION

Hartmut Leininger, Neustadt; Wolfgang Littmann, Mannheim; Joachim Paust, Neuhofen, and Walter Trautmann, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

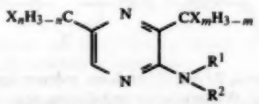
Filed Sep. 16, 1985, Ser. No. 776,460

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433959

Int. Cl.[4] C07D *403/04, 241/20*

U.S. Cl. 544—405 **3 Claims**

1. A 2-amino-3,5-di-(halomethyl)-pyrazine of the formula I



where X is either chlorine or bromine, m is 1 or 2 and n is=m+1, and R^1 and R^2 are each hydrogen or together form a phthalimido radical.

4,692,528

INTERMEDIATES FOR OCTAHYDROBENZOFURO[3,2-e]ISOQUINOLINES

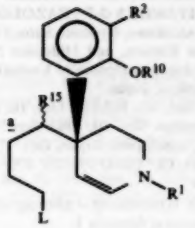
Ashokkumar B. Shenvi, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 522,094, Aug. 11, 1983, Pat. No. 4,537,963, which is a division of Ser. No. 334,839, Dec. 28, 1981, Pat. No. 4,421,916. This application Jun. 11, 1985, Ser. No. 743,415

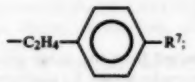
Int. Cl.[4] C07D *491/08*

U.S. Cl. 546—115 **3 Claims**

1. The compound, Compound VIII, having the formula:

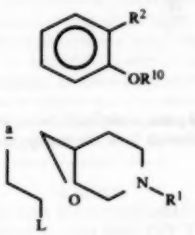


wherein
R^1 is C_{1-10} alkyl, $—CH_2R^6$ or

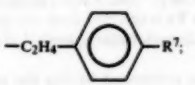


R^2 is —H or C_{1-12} alkoxy;
R^6 is C_{3-6} cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group;
R^7 is —H or C_{1-3} alkyl;
R^{10} is C_{1-10} alkyl;
R^{15} is C_{1-3} alkyl carbonyloxy, —OH, or $—OCH(R^{12})OR^{13}$; wherein
R^{12} and R^{13} are —H or C_{1-3} alkyl and taken together may form a C_{2-5} alkylene group optionally substituted with a methyl group, except that R^{12} and R^{13} may not both be —H;
L is —Cl, —Br, —I, p—$MeC_6H_4SO_3$— or $MeSO_3$; and
a is — or ---.

2. The compound, Compound VII, having the formula:



wherein
R^1 is C_{1-10} alkyl, $—CH_2R^6$ or



R^6 is C_{3-6} cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group and R^7 is —H or C_{1-3} alkyl;
R^2 is —H or C_{1-12} alkoxy;
R^{10} is C_{1-10} alkyl;
L is —Cl, —Br, —I, p—$MeC_6H_4SO_3$— or $MeSO_3$; and
a is — or .

4,692,529

METHOD FOR SYNTHESIZING A MAGENTA COUPLER BY SELECTIVELY ETHERIFYING 4-HYDROXY-5-PYRAZOLONE

Kasaku Masuda, Akishima; Ryosuke Sato; Fumio Ishii, both of Hino; Kazuhiko Kimura, and Hidetaka Ninomiya, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

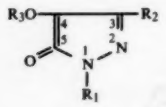
Continuation of Ser. No. 312,317, Oct. 16, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 550,510

Claims priority, application Japan, Oct. 17, 1980, 55-146074

Int. Cl.[4] C07D *231/28, 401/12*

U.S. Cl. 546—141 **6 Claims**

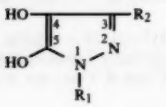
2. A method for synthesizing a photographic magenta coupler having the general formula I:



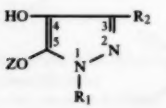
I

wherein R_1 is selected from the group consisting of an aryl group and a heterocyclic group, R_2 is selected from the group consisting of an acylamide group, an anilino group and a ureido group; and R_3 is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group and a heterocyclic group, comprising the steps of:

(a) reacting a compound having the general formula



wherein R_1 and R_2 are as defined above, with a blocking agent to obtain a compound having the general formula II



II

wherein R_1 and R_2 are as defined above and Z represents a blocking group selected from the group consisting of (1)

wherein X is oxygen or sulfur; and R_4 is selected from the group consisting of hydrogen, alkyl, aryl, heterocyclic, alkoxy, aryloxy, heterocyclic oxy, amino, alkylthio and heterocyclic thio; (2) $—SO_2R_5$, wherein R_5 is selected from the group consisting of alkyl, aryl, heterocyclic, hydroxy and amino; and (3) $—R_6$, wherein R_6 is selected from the group consisting of silyl, phosphoryl, benzyl, methoxymethyl, 2-pyranyl and phenacyl;

(b) reacting the compound having the general formula II with an etherification agent selected from the group consisting of an alkyl-etherification agent, an aryl-etherification agent and a heterocyclic-etherification agent to etherify the hydroxy group in the fourth position of said compound; and

(c) removing said blocking group Z from the etherified compound having the general formula II to obtain said coupler having the general formula I.

4,692,530

CHEMICAL AGENTS

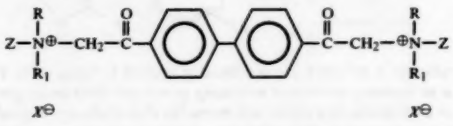
Harold Z. Sommer, Havre de Grace, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1967, Ser. No. 624,649

Int. Cl.[4] C07D *213/69;* **C07C** *125/06*

U.S. Cl. 546—261 **3 Claims**

1. Chemical compound having the formula:



where X is one equivalent of an anion selected from the group consisting of monovalent and polyvalent, said anions being selected from the group consisting of halide, hydrogen sulfate, nitrate, hydrogen oxalate, and perchlorate, R and R_1 are methyl groups and Z is a radical selected from the group consisting of 3-dimethylcarbamoxyphenyl, 2-dimethylcarbamoxybenzyl, and 3-dimethylcarbamoxy-α-picolinyl.

4,692,531

SUBSTITUTED 3,4-DIAMINO-1,2,5-THIADIAZOLES HAVING HISTAMINE H_2-RECEPTOR ANTAGONIST ACTIVITY

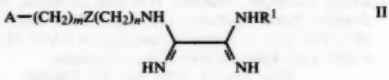
Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, Wallingford, Conn.

Division of Ser. No. 623,588, Jun. 22, 1984, Pat. No. 4,644,006. This application Sep. 25, 1986, Ser. No. 911,613

Int. Cl.[4] C07D *277/48*

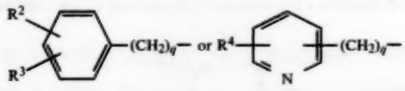
U.S. Cl. 548—193 **5 Claims**

1. A compound of the formula



II

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



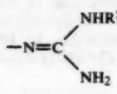
in which q is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 or R^3, taken together, may be methlenedioxy, and R^4 is hydrogen, (lower-)alkyl or (lower)alkoxy:

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is a imidazole, thiazole, thiadiazole, oxazole, oxadiazole or pyrimidine; provided that A may contain one or two substituents, the first substituent being selected from



or $-CH_2NR^6R^7$ and the second substituent selected from (lower)alkyl, halogen or (lower)alkoxy;

R^5 is hydrogen, branched or unbranched (lower)alkyl, (lower)cycloalkyl, or (lower)cycloalkyl(lower)alkyl, in which R^5 may optionally contain one or more halogen atoms selected from fluorine, chlorine and bromine, provided that there is no halogen substituent on the carbon atom directly attached to the nitrogen atom;

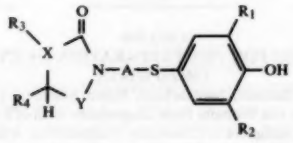
R^6 and R^7 each are independently hydrogen or (lower)alkyl, or, R^6 and R^7, taken together with the nitrogen to which they are attached, may be pyrrolidino, methylpyrrolidino, piperidino, methylpiperidino, homopiperidino or heptamethyleneimino, and a nontoxic pharmaceutically acceptable salt thereof.

4,692,532
SUBSTITUTED N-(4-HYDROXYPHENYLTHIOALKYL) CYCLIC IMIDES

John D. Spivack, Spring Valley; Ramanathan Ravichandran, and Stephen D. Pastor, both of Yonkers, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 23, 1984, Ser. No. 674,217
Int. Cl.[4] C07D *233/70, 233/72, 233/80, 487/04*
U.S. Cl. 548—312 **11 Claims**

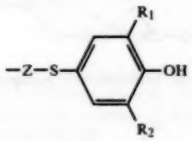
1. A compound of the formula



wherein

R_1 and R_2 independently are alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 12 carbon atoms,

R_3 and R_4 independently are hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms or the group



or together can also form cycloalkyl of 5 to 6 carbon atoms, pyrrolidine or piperidine;

A is alkylene of 1 to 18 carbon atoms or substituted alkylene of the formula $(R_5)(R_6)C<$ wherein R_5 and R_6 independently are hydrogen, alkyl of 1 to 12 carbon atoms or phenyl;

X is

or nitrogen;

Y is $-CH_2-$ or

; and

Z is A or a direct bond.

9. N-(3,5-di-tert-butyl-4-hydroxyphenylthiomethyl)-2-dodecen-2-yl-succinimide.

10. 3-(3,5-di-tert-butyl-4-hydroxyphenylthiomethyl)-5,5dimethyl hydantoin.

4,692,533
SELECTIVE PREPARATION OF N-(AMIDOALKYL)IMIDES AND RELATED COMPOUNDS

Pen-Chung Wang, and Steven P. Crain, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1985, Ser. No. 774,220
Int. Cl.[4] C07D *487/04, 233/74*
U.S. Cl. 548—312 **18 Claims**

1. A process comprising contacting a 2-oxazoline and an imide under reaction conditions such that a corresponding N-(amidoalkyl)imide is formed.

4,692,534
PREPARATION OF CAFESTOL

Raymond Bertholet, Blonay, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Apr. 3, 1986, Ser. No. 847,488
Int. Cl.[4] C07D *307/77*
U.S. Cl. 549—456 **18 Claims**

1. A process for converting kahweol to cafestol comprising hydrogenating kahweol in the presence of a palladium catalyst which has been partially deactivated by lead and which is on a support selected from the group consisting of a calcium carbonate support and an active carbon support.

4,692,535
PURIFICATION OF PROPYLENE OXIDE

Harold V. Larson, Houston, Tex., and Hyman D. Gillman, Spring City, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 22, 1986, Ser. No. 944,896
Int. Cl.[4] C07D *301/32*
U.S. Cl. 549—542 **8 Claims**

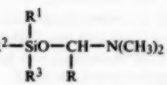
1. A method of purifying propylene oxide containing greater than 0.1 p.p.m. of poly(propylene oxide) polymer contaminant of a molecular weight of at least about 50,000 which comprises contacting said propylene oxide at a temperature ranging from between about 10° C. and 100° C. with an adsorbent selected from the group consisting of activated carbon and attapulgite, for a time sufficient to reduce the concentration of said polymer contaminant to below 0.1 p.p.m. and recovering the purified propylene oxide product.

4,692,536
PROCESS FOR THE PREPARATION OF HEMIAMINALS, AND THE USE THEREOF

Robert W. Lang, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 14, 1986, Ser. No. 917,948
Claims priority, application Switzerland, Oct. 21, 1985, 4515/85
Int. Cl.[4] C07F *7/10, 7/18*
U.S. Cl. 556—413 **13 Claims**

1. A process for the preparation of a hemiaminal of formula I



(I)

wherein R is unsubstituted or substituted polyhalogenated alkyl, cycloalkyl or aralkyl containing at least one fluorine

atom and R^1, R^2 and R^3 are each independently a hydrogen atom, alkyl, cycloalkyl or aryl, which process comprises

(a) reacting with one another at least equimolar amounts of dimethylformamide, a silane of formula II

$$R^1R^2R^3SiX \quad \text{(II)}$$

wherein X is chlorine or bromine and R^1, R^2 and R^3 are as defined above, and a compound of formula III

$$RY \quad \text{(III)}$$

wherein R is as defined above and Y is chlorine, bromine or iodine, in the presence of zinc, or

(b) reacting with one another at least equimolar amounts of dimethylformamide, a silane of formula II and a zinc compound of formula IV

$$RZnY.yL \quad \text{(IV)}$$

wherein R and Y are as defined above, L is a ligand and Y is 1 or 2.

4,692,537

ORGANOSILICON COMPOUNDS

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018

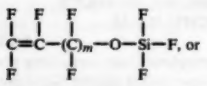
PCT No. PCT/US84/00521, § 371 Date Dec. 9, 1985, § 102(e) Date Dec. 9, 1985, PCT Pub. No. WO85/04660, PCT Pub. Date Oct. 24, 1985

Continuation-in-part of Ser. No. 312,073, Oct. 16, 1981, Pat. No. 4,458,087. This PCT application Apr. 9, 1984, Ser. No. 810,307

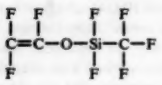
Int. Cl.[4] C07F *7/08, 7/18*

U.S. Cl. 556—484 **11 Claims**

1. A fluorine containing compound which has the formula



(III)



(IV)

where m is 0 or 1.

4,692,538

TRICHLOROETHANIMIDIC ACID ESTERS

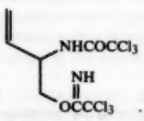
Dolatrai M. Vyas; Terrence W. Doyle, both of Fayetteville, and Yulin Chiang, Clay, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 368,180, Apr. 14, 1982, abandoned. This application May 28, 1985, Ser. No. 737,752

Int. Cl.[4] C07C *119/18, 103/127*; C07D *261/02, 321/00*

U.S. Cl. 558—6 **3 Claims**

1. The intermediate having the formula



4,692,539

PENTAERYTHRITOL DIPHOSPHITE STABILIZERS AND PROCESS

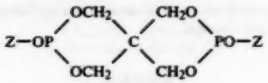
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 685,370, Dec. 24, 1984, abandoned. This application Oct. 24, 1986, Ser. No. 922,803

Int. Cl.[4] C07F *9/15*; C08K *5/52*

U.S. Cl. 558—78 **6 Claims**

1. In the method for the preparation of a pentaerythritol diphosphite of the formula



wherein Z is alkyl, alkenyl, aryl, aralkyl, or alkanoyl-substituted aryl or each of these groups substituted by hydroxy, alkoxy or halogen; which comprises reacting at elevated temperatures a compound of the formula Z-OM wherein M is hydrogen or an alkali or alkaline earth metal with 3,9-dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane in the presence of a solvent and a strong base, the improvement comprising conducting the reaction in the presence of a catalytic amount of a mono- or polyalkylene glycol ether catalyst.

4,692,540

PROCESS FOR THE PREPARATION OF CYCLIC PHOSPHITES

Hugo Illy, Reinach, Switzerland; Björn Schliebs, Lindenfels-Glattbach, and Wilhelm Hess, Jugenheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

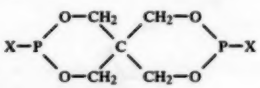
Filed Apr. 15, 1985, Ser. No. 723,115

Claims priority, application Switzerland, Apr. 17, 1984, 1945/84; Jun. 26, 1984, 3066/84

Int. Cl.[4] C07F *9/15*

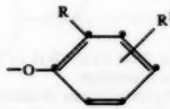
U.S. Cl. 558—78 **9 Claims**

1. A process for the preparation of a pentaerythritol ester of a phosphorous acid derivative of formula I



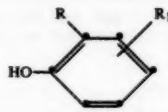
(I)

wherein X is chlorine, bromine, or a group of formula II



(II)

wherein each of R and R_1 independently of the other is hydrogen or C_1–C_8alkyl, by reacting pentaerythritol with a phosphorous trihalide, in an inert organic solvent, and, if X is a group of formula II, additionally with a phenol of formula III



(III)

which process comprises carrying out the reaction in the presence of a catalyst selected from the group consisting of quater-

nary ammonium, phosphonium, arsonium, pyridinium, piperazinium and thiazolium salts, tertiary sulfonium salts, crown ethers and linear polyethers, in an amount of 0.5 to 20 mol%, based on pentaerythritol, said phenol of formula III being added at the start of, during or after the reaction of pentaerythritol with the phosphorous trihalide.

4,692,541

PHOSPHORUS-CONTAINING α-AMINO NITRILES AND A PROCESS FOR THEIR PREPARATION

Hans-Joachim Zeiss, Sulzbach, and Hilmar Mildenberger, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

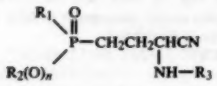
Filed Mar. 7, 1986, Ser. No. 837,721

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1985, 3508573

Int. Cl.[4] **C07F** *9/32, 9/50*

U.S. Cl. 558—87 **23 Claims**

1. A process for the preparation of a compound of the formula I



(I)

in which

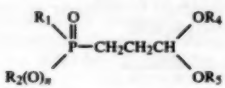
R_1 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen or by alkoxycarbonyl, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_2 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_3 is hydrogen, (C_1–C_6)-alkyl or -phenalkyl, (C_1–C_6)-acyl, (C_1–C_6)-alkoxycarbonyl, or (C_6–C_{10})-aryloxycarbonyl, and

n is zero or one,

which comprises reacting a compound of the formula II

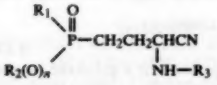


(II)

in which R_4 and R_5, independently of one another, are (C_1–C_6)-acyl, (C_1–C_6)-alkoxycarbonyl, phenoxycarbonyl or naphthoxycarbonyl, in the presence of alkali metal cyanides, with amines of the formula III

$$H_2H—R_3 \quad \text{(III)}.$$

18. a compound of the formula I



(I)

in which

R_1 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen or by alkoxycarbonyl, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_2 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_3 is hydrogen, (C_1–C_6)-alkyl or -phenalkyl, (C_1–C_6)-acyl, (C_1–C_6)-alkoxycarbonyl, or (C_6–C_{10})-aryloxycarbonyl, and

n is zero or one.

4,692,542

PHOSPHORYLATING AGENT

Godefridus I. Tesser, and Christianus A. A. Claesen, both of Nijmegen, Netherlands, assignors to Stichting Katholieke Universiteit, Nijmegen, Netherlands

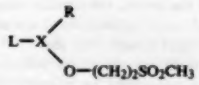
Filed Jun. 20, 1984, Ser. No. 622,571

Claims priority, application Netherlands, Jul. 1, 1983, 8302353

Int. Cl.[4] **C07F** *9/146, 9/14, 9/65*

U.S. Cl. 558—184 **4 Claims**

1. A phosphorylating agent having the formula:



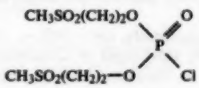
wherein

X is P or P=O;

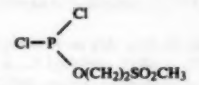
L is a leaving group; and

R is a leaving group L, or —O—$(CH_2)_2SO_2CH_3$.

3. The phosphorylating agent having the formula:



4. The phosphorylating agent having the formula:



4,692,543

OPTICALLY-ACTIVE DI-[3-CHLORO-2-OXY-PROPYLTRIMETHYLAMMONIUM]-TARTRATE

Leander Tenud, Visp, and Jacques Gosteli, Basel, both of Switzerland, assignors to Lonza Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 717,547, Mar. 29, 1985, abandoned. This application Feb. 25, 1986, Ser. No. 832,760

Claims priority, application Switzerland, Apr. 4, 1985, 1704/84

Int. Cl.[4] **C07C** *120/04, 121/16*

U.S. Cl. 558—342 **4 Claims**

1. Process for producing optically-active carnitine nitrile chloride from optically-active di-(3-chloro-2-oxy-propyltrimethylammonium)-tartrate comprising (a) dissociating the di-(3-chloro-2-oxy-propyltrimethylammonium)-tartrate (i) with $CaCl_2$ into Ca-tartrate and optically active 3-chloro-2-oxy-propyltrimethylammonium chloride, or (ii) with two equivalents of HCl and one equivalent of KOH or one equivalent of HCl and one equivalent KCl into K-H-tartrate and optically-active 3-chloro-2-oxy-propyltrimethylammonium chloride, and (b) converting the optically-active 3-chloro-2-oxy-propyltrimethylammonium chloride with an inorganic cyanide into the optically-active carnitine nitrile chloride.

4,692,544
INHIBITING POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Richard N. Goerner, Mount Holly; J. Michael Hipp, and Ruth H. Hipp, both Iron Station, all of N.C., assignors to Sandoz Ltd., Basel, Switzerland

Filed Aug. 23, 1985, Ser. No. 768,709

Int. Cl.[4] C07C *69/54, 69/56, 7/20, 29/94, 51/50, 85/26, 121/30*

U.S. Cl. 560—4 **38 Claims**

1. A composition comprising a mixture of

(A) a polymerizable ethylenically unsaturated monomer selected from the group consisting of unsaturated carboxylic acids and the esters, anhydrides, amides, halides and nitriles thereof, vinyl halides, vinyl acetate, vinyl alcohol and aromatic vinyl compounds and

(B) an amount sufficient to inhibit polymerization of said monomer of a compound or mixture of compounds of formula (I)

$$R—X—Ar_1—NH—Ar_2—Y—H \quad (I)$$

wherein

Ar_1 and Ar_2 are, independently, substituted or unsubstituted phenylene, naphthylene, anthrylene or phenanthrylene,

X and Y, independently, are —NH—, —S— or —O—,

R is hydrogen; substituted or unsubstituted $C_{1\text{-}10}$ alkyl; substituted or unsubstituted $C_{5\text{-}10}$ cycloalkyl; substituted or unsubstituted phenyl, naphthyl, anthryl or phenanthryl; substituted or unsubstituted phenyl $C_{1\text{-}10}$ alkyl or naphthyl $C_{1\text{-}10}$ alkyl; or substituted or unsubstituted phenyl $C_{5\text{-}10}$ cycloalkyl or naphthyl $C_{5\text{-}10}$ cycloalkyl;

and any substituent on Ar_1, Ar_2 or R is $C_{1\text{-}10}$ alkyl, phenyl, naphthyl, phenyl $C_{1\text{-}10}$ alkyl, naphthyl $C_{1\text{-}10}$ alkyl, $C_{1\text{-}10}$ alkoxy, hydroxy, $C_{1\text{-}10}$ alkylamino, amino, thiol, $C_{1\text{-}10}$ alkylthio, $C_{5\text{-}10}$ cycloalkyl, $C_{5\text{-}10}$ cycloalkyloxy or $C_{5\text{-}10}$ cycloalkylamino.

4,692,545
METHOD FOR PREPARATION OF MERCAPTOBENZOATES

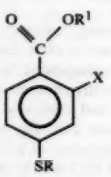
Charles G. Carter, Columbia, Md., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 12, 1986, Ser. No. 940,997

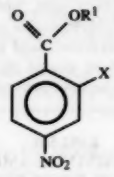
Int. Cl.[4] C07C *149/40*

U.S. Cl. 560—18 **10 Claims**

1. A method of preparing a compound of the formula



wherein R is alkyl, alkenyl, aryl or benzyl; R^1 is alkyl; and X is halogen or nitro comprising reacting a benzoate of the formula



with a mercaptan of the formula R—SH in the presence of a polar aprotic solvent and an inorganic base.

4,692,546
PROCESS FOR PRODUCING ACYLOXY AROMATIC CARBOXYLIC ACIDS

Kenneth G. Davenport, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 633,832, Jul. 24, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 779,893

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] C07B *41/08;* **C07C** *51/245, 59/52, 69/017*

U.S. Cl. 560—130 **9 Claims**

1. A process comprising oxidizing an alkyl alkanoyloxy aryl ketone with oxygen in the presence of a soluble salt of the manganese cation, a lower-alkylcarboxylic acid anhydride and a co-reductant or promoter to form an alkanoyloxy aryl carboxylic acid.

2. The process of claim 1 wherein said ketone is 4-acetoxyacetophenone, said lower-alkylcarboxylic acid anhydride is acetic anhydride, said co-reductant is acetaldehyde, and said product is 4-acetoxybenzoic acid.

4. A process comprising reacting an alkyl hydroxy aryl ketone with a lower-alkylcarboxylic acid anhydride to form an alkyl lower-alkanoyloxy aryl ketone, and oxidizing said alkyl alkanoyloxy aryl ketone with oxygen in the presence of a soluble salt of the manganese cation, a lower-alkylcarboxylic acid anhydride and a co-reductant or promoter to form a lower-alkanoyloxy aryl carboxylic acid.

4,692,547
PROCESS FOR THE PREPARATION OF GLYOXYLIC HEMIACETAL ESTERS

Robert K. Driscoll, Frankfurt am Main; Ernst I. Leupold, Neu-Anspach, and Wolfgang Ebertz, Bonn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,519

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446528

Int. Cl.[4] C07C *67/31*

U.S. Cl. 560—186 **8 Claims**

1. A process for the preparation of a glyoxylic hemiacetal ester, which comprises catalytically oxydehydrogenating a glycolic ester in a gas phase at a temperature between 100° and 600° C. and a residence time between 0.05 and 1 second to give a gaseous reaction mixture containing a glyoxylic ester, introducing the gaseous reaction mixture with 1 to 30 mole of a saturated primary or secondary alcohol per mole of the glyoxylic ester into a distillation column, said alciohol having 2 to 8 carbon atoms and being suitable as an entraining agent, and then reacting the glyoxylic ester with the alcohol and distilling overhead the water of reaction, other low boilers and part of the excess alcohol to yield a glyoxylic hemiacetal ester and the remainder of the excess alcohol as the bottom product.

4,692,548

PROCESS FOR THE PREPARATION OF UNSATURATED COMPOUNDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 14, 1986, Ser. No. 862,927

Claims priority, application United Kingdom, Jun. 14, 1985, 8515139

Int. Cl.[4] C07C 67/347, 2/32

U.S. Cl. 560—202 15 Claims

1. A process for dimerization in the liquid phase which comprises reacting an ethylenically unsaturated compound of the formula:

(I)

in which R^1 represents a hydrogen atom, an alkyl group having not more than two carbon atoms, a vinyl group or a hydrocarbyloxycarbonyl group, with an ethylenically unsaturated compound of the formula:

(II)

in which R^2 represents a hydrogen atom or a hydrocarbyloxycarbonyl group, with the restriction that, when R^1 represents an alky group, R^2 does not represent a hydrogen atom, which process is carried out in the presence of a catalytic system formed by combining:

(a) a palladium and/or ruthenium compound;

(b) a monodentate ligand which comprises a compound containing one trivalent N or P atom as coordinating atom;

(c) a silver and/or cupric salt having a non-coordinating anion, and

(d) a quinone.

4,692,549

CARBOALKOXYLATION OF BUTADIENE TO FORM DIALKYL ADIPATE

Harold S. Bruner, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1986, Ser. No. 879,399

Int. Cl.[4] C07C 67/38

U.S. Cl. 560—204 11 Claims

1. A process for the preparation of dialkyl adipate which comprises adding to a mixture containing alkyl 3-pentenoate, cobalt catalyst, a tertiary nitrogen base cocatalyst, a lower alkyl alcohol, and carbon monoxide, an amount of an alkanoic acid having a pKa of greater than 3 in an amount sufficient to keep the cobalt catalyst active and reacting the resulting mixture to form alkyl adipate by the carboalkyxylation of alkyl 3-pentenoate.

4,692,550

CONTINUOUS PROCESS FOR THERMAL SPLITTING OF CARBAMIC ACID ESTERS

Theodor Engbert; Günter Hammen, both of Dormagen; Hartmut Knöfel, Odenthal, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,347

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215591

Int. Cl.[4] C07C 118/00

U.S. Cl. 560—345 10 Claims

1. A continuous process for thermally splitting N-monosubstituted carbamic acid esters comprising:

(a) thermally splitting an N-monsubstituted carbamic acid ester which is flowed down or passed over an inner wall of a tube reactor at a temperature of from 150° to 450° C. and under a pressure of from 0.001 to 20 bar into a fraction which is predominantly isocyanate and a fraction which is predominantly hydroxyl compound; and

(b) removing any gaseous fraction formed under the splitting conditions at the head of the tube reactor and collecting any liquid fraction which accumulates at the base of the tube reactor under the splitting conditions.

4,692,551

PREPARATION OF CARBOXYPROPYLATED NON-IONIC SURFACTANTS

Kou-Chang Liu, Wayne, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Jul. 23, 1986, Ser. No. 887,298

Int. Cl.[4] C07C 59/48

U.S. Cl. 562—471 15 Claims

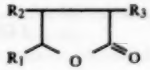
1. The process which comprises reacting an alcohol ether having the formula

$$RY(OCH_2CH_2)_nOH$$

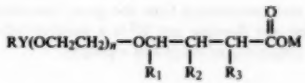
with a metal hydroxide having the formula MOH, to produce the corresponding salt having the formula

$$RY(OCH_2CH_2)_nOM \text{ and}$$

reacting said salt with a butyrolactone having the formula



at a temperature of between about 50 and about 300° C., under a pressure of from about 14 to about 70 psig. until the desired conversion has taken place to produce the corresponding carboxypropylated polyethylene glycol salt having the formula



wherein n has an average value of 2 to 50; R is a saturated or olefinically unsaturated aliphatic radical having from 4 to 50 carbon atoms; Y is a direct bond or an aryl group optionally substituted with a member selected from the group consisting of halogen, trihalomethyl, cyano, nitro, alkyl and alkoxy; R_1, R_2 and R_3 are each independently hydrogen or alkyl having from 1 to 4 carbon atoms and M is a cation selected from the group consisting of Na^+, K^+ and Li^+.

4,692,552

PROTEASE INHIBITORS

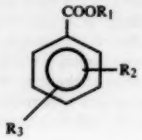
Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 664,447, Oct. 24, 1984, which is a continuation of Ser. No. 492,842, May 9, 1983, Pat. No. 4,499,295. This application Feb. 18, 1986, Ser. No. 831,238

Int. Cl.[4] C07C 65/04, 69/88

U.S. Cl. 562—475 2 Claims

1. Compounds of the formula:



wherein R_1 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
wherein R_2 is:
(a) hydroxy; or
(b) alkoxy of 1 to 6 carbon atoms, inclusive;
wherein R_3 is —CH=CHR_4
wherein R_4 is alkyl of 13 to 25 carbon atoms inclusive or the pharmacologically acceptable addition salts thereof.

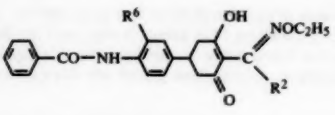
4,692,553

CYCLOHEXENONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Michael Keil, Freinsheim; Ulrich Schirmer, Heidelberg; Dieter Jahn, Edingen-Neckarhausen; Rainer Becker, Bad Durkheim; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,257
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427695; Sep. 14, 1984, 3433767
Int. Cl.[4] C07C *131/10, 131/04;* **A01N** *37/22, 37/24*
U.S. Cl. 564—185 **3 Claims**

1. A cyclohexenone of the formula



wherein R^6 is a member selected from the group consisting of chlorine, bromine and fluorine and R^2 is a member selected from the group consisting of ethyl and n-propyl.

4,692,554

PROCESS FOR PRODUCING 1,3-BIS(3-AMINOPHENOXY)BENZENE

Keizaburo Yamaguchi; Yukihiro Yoshikawa; Yoshimitsu Tanabe; Kenichi Sugimoto, and Akihiro Yamaguchi, all of Tokyo, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,732
Claims priority, application Japan, Oct. 18, 1983, 58-193428; Dec. 6, 1983, 58-229075; Dec. 6, 1983, 58-229076
Int. Cl.[4] C07C *41/09, 93/14*
U.S. Cl. 564—430 **6 Claims**

1. A process for producing 1,3-bis(3-aminophenoxy) benzenes which comprises reacting a halogenobenzene selected from the group consisting of 1,3,5-trihalogenobenzenes, 1,2,3,4-tetrahalogenobenzenes and 1,2,4,5-tetrahalogenobenzenes with 3-aminophenol in the presence of a dehydrohalogenating agent in an aprotic polar solvent and in the absence of an Ullmann reaction promotor to obtain 1,3-bis(3-aminophenoxy)-5-halogenobenzen, 1,3-bis(3-aminophenoxy)-2,4-dihalogenobenzen or 1,5-bis(3-aminophenoxy)-2,4-dihalogenobenzen and dehalogenating the resulting bis(3-aminophenoxy) halobenzene by its reduction.

4,692,555

PREPARATION OF DIPHENOLICS

Kju H. Shin, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 9, 1984, Ser. No. 598,225
Int. Cl.[4] C07C *39/12, 37/11*
U.S. Cl. 568—722 **25 Claims**

1. A process for preparation of diphenolic compounds, said process comprising:
(1) reacting in the presence of a catalytic amount of a secondary amine catalyst: an aldehyde, an alcohol, and a first phenol having exactly two of the three positions ortho and para to the hydroxyl group substituted and the other two meta positions optionally substituted with independently selected alkyl, cycloalkyl, aryl, alkaryl, aralkyl, halogen, or a group of the formula —$(R'''')_n$—CX_3 where R'''' is a divalent hydrocarbon preferably containing about one to twelve carbon atoms, n is zero or one, and X is halogen to form as the predominant product a hydroxybenzyl ether of said alcohol; and
(2) reacting said ether product of step (1) in the presence of an acid catalyst with a second phenol having at least one position ortho or para to the hydroxyl group unsubstituted except for H.

4,692,556

REPEATING TEMPERATURE SENSING IMMERSION PROBE

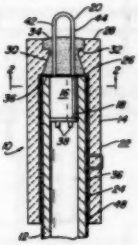
Theo P. C. Bollen, Genk, Belgium, and John E. Cassidy, Churchville, Pa., assignors to Electro-Nite Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 626,498, Jun. 29, 1984, Pat. No. 4,645,865. This application Mar. 24, 1986, Ser. No. 843,436

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541326

Int. Cl.[4] H01L *35/02*

U.S. Cl. 136—234 **11 Claims**



1. A temperature sensing device suitable for repeated immersion into a molten metal bath comprising: a protection sleeve made of a fibrous refractory material capable of withstanding repeated immersions into a molten metal bath having a central longitudinally extending bore therethrough; a support tube within the bore of the protection sleeve; and a thermocouple unit having a body portion supported by the support tube within one end thereof and a thermocouple extension portion extending from the body portion through the end of the protection sleeve, the support tube wrapped with a reflective foil material which substantially covers the entire surface of the support tube within the protection sleeve.

4,692,557

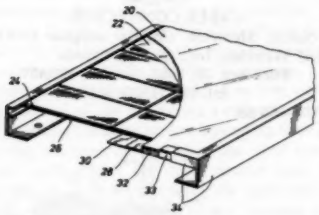
ENCAPSULATED SOLAR CELL ASSEMBLAGE AND METHOD OF MAKING

Gay M. Samuelson, Tempe, Ariz., and David J. St. Clair, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 16, 1986, Ser. No. 919,918

Int. Cl.[4] H01L *25/02, 31/18, 21/56*

U.S. Cl. 136—251 **28 Claims**



1. A solar cell assemblage comprising:

(a) a pre-treated silanized transparent substrate;

(b) a layer of semiconductor material comprising at least one solar cell;

(c) an electrical contact on the surface of said layer of semiconductor material;

(e) an extruded transparent film for encapsulating the assemblage comprising (a), (b) and (c), said film comprising about 75 to about 91 parts by weight of a blend of:

about 65 to about 75 parts by weight of a selectively hydrogenated two-block polymer wherein one polymer block is designated by A and a second polymer block is designated by B such that prior to hydrogenation,

(1) each A is a polymer block of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said A blocks comprising from about 10 to about 40% by weight of the total block copolymer, and

(2) each B is a polymer block having a number average molecular weight in the range of from about 10,000 to about 150,000 and is formed by polymerizing a conjugated diene having from 4 to 10 carbon atoms per molecule, and said B blocks comprising from about 90 to about 60% weight of the total block copolymer, and

about 25 to about 35 parts by weight of a selectively hydrogenated multiblock copolymer which contains at least two kinds of polymer blocks wherein one polymer block is designated by A and a second polymer block is designated by B such that:

(1) each A is a polymer endblock of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said A blocks comprising from about 10 to about 40% by weight of the total block copolymer, and

(2) each B is a polymer midblock having a number average molecular weight in the range of from about 10,000 to about 150,000 and is formed by polymerizing a conjugated diene having from 4 to 10 carbon atoms per molecule, and said B blocks comprising from about 90 to about 10% weight of the total block copolymer,

about 8.5 to about 23.5 parts by weight of an (alpha) methyl styrene polymer tackifying resin; and

about 0.5 to about 1.5 parts by weight of a mixture of a phenolic antioxidant, a UV absorber with benzotriazole functionality and a UV absorber with hindered amine functionality;

(f) a frame to contain said encapsulated solar cell laminate; and

(g) sealant to seal the frame to the solar cell laminate.

4,692,558

COUNTERACTION OF SEMICONDUCTOR IMPURITY EFFECTS

Alan E. Delahoy, Princeton; Vikram L. Dalal, Lawrenceville, both of N.J., and Erter Eser, New York, N.Y., assignors to Chronar Corporation, Princeton, N.J.

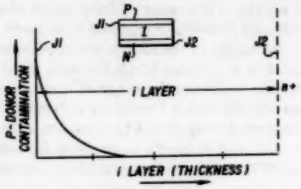
Filed May 11, 1983, Ser. No. 493,700

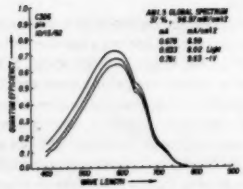
Int. Cl.[4] H01L *31/06, 31/18*

U.S. Cl. 136—258 **17 Claims**

9. An amorphous semiconductor device of multi-layer structure wherein an undersired contaminant present in a limited

region of one layer thereof is slightly over-compensated by a dopant incorporated in said limited region.





10. The semiconductor device of claim 9 wherein said limited region is part of a layer of intrinsic material and said device is a solar cell.

4,692,559

THIN GAAS SOLAR CELL STRUCTURES

M. Edmund Ellion, Arcadia, and George Wolff, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 773,910, Sep. 9, 1985, abandoned. This application Oct. 9, 1986, Ser. No. 918,585
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—262 **2 Claims**

1. A solar cell, comprising:

a layer of p-type gallium arsenide haviang a thickness of not greater than about 0.5 micrometers;

a layer of n-type gallium arsenide, said layer of p-type gallium arsenide and the layer of n-type gallium arsenide together constituting an active semiconductor solar cell;

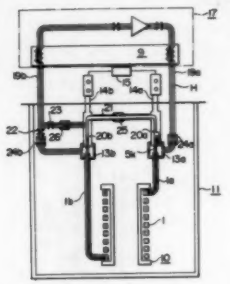
a glass cover in contact with said active semiconductor solar cell, said solar cell having no charge recombination inhibitory layer in contact with said layer of p-type gallium arsenide.

4,692,560

FORCED FLOW COOLING-TYPE SUPERCONDUCTING COIL APPARATUS

Yoshiji Hotta, Hitachi; Kunishige Kuroda, Mito; Hiroshi Kimura, Tokyo; Nobuhiro Hara, Hitachi, and Naofumi Tada, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,045
Claims priority, application Japan, Jul. 19, 1985, 60-158384
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—15 CA **10 Claims**



1. A forced flow cooling-type superconducting coil apparatus comprising:

a superconducting coil made of a coiled superconducting conductor having a hollow conduit and having superconducting wires inserted into said conduit;

current leads for supplying currents to superconducting wires of said superconducting coil, said current leads being respectively connected to ends of said superconducting coil;

first cooling means for forcibly flowing coolant for cooling said superconducting wires from one end of said hollow conduit of said superconducting coil to the other end thereof through said hollow conduit; and

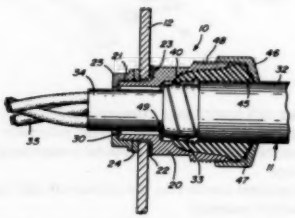
second cooling means including branch means for branching a part of said coolant to flow from a position near said one end of said hollow conduit of said first cooling means to another position near said another end of said hollow conduit along at least a part of each of said current leads thereby cooling said current leads by said branched coolant.

4,692,561

CABLE CONNECTOR

William Nattel, Montreal, Canada, assignor to Commander Electrical Materials, Inc., Quebec, Canada

Filed Sep. 26, 1985, Ser. No. 780,451
Int. Cl.[4] H02G *3/18*
U.S. Cl. 174—65 SS **4 Claims**



1. An electrical cable connector for sealing a cable passing through a partition, comprising:

a rigid tubular housing with external attachment means for

attachment to an aperture in the partition, the tubular housing having a passage therethrough for a cable, and a concave curved shoulder at a small termination of a frusto-conical inner surface within the passage,

a substantially tubular seal made from firm resilient elastromeric material, the seal having a cylindrical inner surface, a frusto-conical outer surface extending from a small end, having a convex curved lip at the small end where the outer surface and the inner surface join, the convex curved lip (adapted to match the) having substantially the same curvature as the concave curved shoulder of the housing, a large end surface on the tubular seal at the other end of the seal joining the inner surface and the outer surface, the seal fitting within the housing with the curved lip against the curved shoulder, and

a threaded cover to fit on an external thread on the housing to push against the large end surface of the seal so that the curved lip of the seal is swivelled inwards and is adapted to contact the cable in the housing.

4,692,562

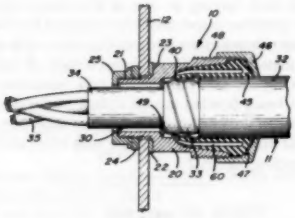
SEAL FOR A CABLE CONNECTOR

William Nattel, Montreal, Canada, assignor to Commander Electrical Materials, Inc., Quebec, Canada

Filed Sep. 26, 1985, Ser. No. 780,452

Int. Cl.[4] H02G *3/18*

U.S. Cl. 174—65 SS **6 Claims**



1. An electrical cable connector for sealing a cable passing through a partition, comprising:

a rigid tubular housing with external attachment means for attachment to an aperture in the partition, the tubular housing having a passage therethrough for a cable, and a concave curved shoulder at a small termination of a frusto-conical inner surface within the passage,

a substantially tubular seal made from firm resilient elastomeric material, the seal having a cylindrical inner surface, a fursto-conical outer surface extending from a small end, having a convex curved lip at the small end where the outer surface and the inner surface join, the convex curved lip having substantially the same curvature as the concave curved shoulder of the housing, a large end surface on the tubular seal at the other end of the seal joining the inner surface and the outer surface, and longitudinal recesses formed in the seal between the inner surface and the outer surface, the recesses extending from the convex curved lip at the small end towards the large end surface, the seal fitting within the housing with the curved lip against the curved shoulder, and

a threaded cover to fit on an external thread on the housing to push against the large end surface of the seal so that the curved lip of the seal is compressed and adapted to contact the cable in the housing.

4,692,563

CABLE GLAND EMBODYING MOISTURE-PROOF SEAL

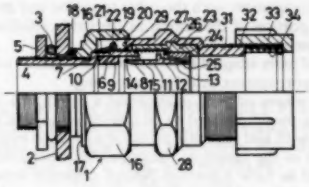
Franz Lackinger, Krugersdorp, South Africa, assignor to Westward Investments Limited, Hong Kong

Continuation-in-part of Ser. No. 668,215, Nov. 5, 1984, Pat. No. 4,629,825. This application Aug. 20, 1986, Ser. No. 898,110

Claims priority, application South Africa, Feb. 28, 1986, 86/1512

Int. Cl.[4] H02G *15/04*

U.S. Cl. 174—65 SS **10 Claims**



1. An electrical cable gland comprising at least two tubular parts, a first one of which has an externally screw-threaded zone co-operating with an internally screw-threaded zone of the other or second part, said first part having, in addition, at a location remote from the internally screw-threaded second part, a smooth outer sealing surface with which co-operates an end region of an elastomeric sealing sleeve, the opposite end region of which is supported or preformed so as to flare outwardly upon axial compression thereof, the wall thickness of the sealing sleeve being small relative to its length so as to promote flaring and not simply axial compression, the arrangement being such that, upon operative installation, the adjacent end face of the internally screw-threaded second part contacts and seals against said opposite end region of the elastomeric sealing sleeve while urging the adjacent end region of the sleeve radially outwardly as the two parts are moved together by means of the screw-thread to effectively seal the screw-threads of the two parts from the exterior.

4,692,564

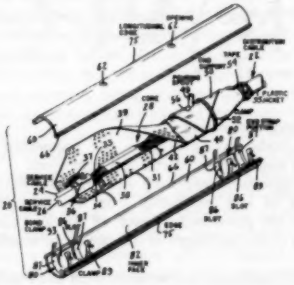
CABLE SUPPORT SYSTEM

Eric R. Campbell, Alpharetta, and Joe B. Moss, Lawrenceville, both of Ga., assignors to American Telephone & Telegraph Company, AT&T Technologies, Inc., Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Feb. 28, 1986, Ser. No. 835,022

Int. Cl.[4] H02G *15/113*

U.S. Cl. 174—92 **13 Claims**



1. A cable and cable support system, which comprises: a length of cable;

substrate means for enclosing a portion of said length of cable to shield the portion of the length of cable from a surrounding environment;

stabilizing means attached to said substrate means and disposed within said substrate means for inhibiting movement of the portion of the cable, said stabilizing means having a portion thereof disposed between the portion of the length of the cable and said substrate means and extending from said portion of said stabilizing means between the portion of the length of the cable and said substrate means about and in engagement with at least a portion of the periphery of said cable; and

means for securing said stabilizing means to the cable and cooperating with said stabilizing means to provide sufficient engagement with the cable to inhibit any movement of the portion of the length of the cable relative to said substrate means.

7. A kit of parts adapted to be assembled together to provide a cable support system, said kit comprising:

substrate means adapted to enclosed a length of a cable;

stabilizing means adapted to be connected to said substrate means with said substrate means at a location external to a portion of the length of the cable, said stabilizing means adapted to have a portion thereof disposed between the length of the cable and said substrate means and adapted to extend from said portion of said stabilizing means between the cable and said substrate means about at least a portion of the cable; and

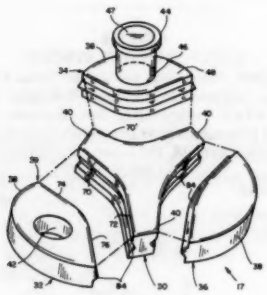
means adapted to secure said stabilizing means to the cable for cooperating with said stabilizing means to provide sufficient engagement with the cable to inhibit substantially any movement of the portion of the length of the cable relative to said substrate means.

4,692,565

SEGMENTED END SEAL AND CLOSURE

Lowell Koht, Cary, and Gerald L. Shimirak, Fuquay-Varina, both of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 6, 1986, Ser. No. 826,716
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—93 **18 Claims**



10. A closure comprising

a closure body having at least one segmented end seal wherein said segmented end seal comprises:

a support structure comprising a central solid portion and a plurality of legs emanating from the central portion; wherein the distal end of each of the legs comprises a segment of the periphery of the assembled segmented end seal;

at least two pie shaped end sections sized and configured for mating with said support structure in that each leg of said support structure has a first surface and an adjacent leg has a second surface for abutting complementary first and second surfaces, respectively, of each of said end sections, each of said sections having a portion of its periphery which comprises a segment of the periphery of the assembled segmented end seal so that when said sections and said support structure are mated together, said assembled segmented end seal has a uniform periphery;

wherein at least one of said sections contains an aperture for receiving a cable, the aperture being located entirely within the periphery of said section; and

wherein the assembled segmented end seal is configured such that:

(a) the central portion of said support structure is positioned so as to be the center of said end seal;

(b) each pie shaped end section may be removed without disturbing any other end section; and

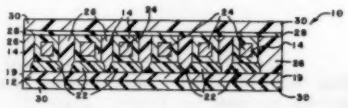
(c) each pie shaped end section is seated in said support structure by the first and second surfaces of said support structure.

4,692,566

RIBBON CABLE

John C. Kauffman, Fort Wayne, Ind., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Jul. 24, 1984, Ser. No. 634,040
Int. Cl.[4] H01B *7/08*
U.S. Cl. 174—117 FF **19 Claims**



11. A ribbon cable comprising a plurality of spaced elongated conductors extending the full length of said cable, said conductors each having an axis in a common plane, and an essentially continuous and concentric coat of flexible insulation material superimposed on said conductor, a ribbon of flexible insulation material extending the full length of said cable, said ribbon having an axis parallel to said conductor axes, said conductors being bonded to said ribbon, and a continuous and uniform coat of flexible bonding material superimposed on said ribbon, said ribbon being between said conductors and said coat of bonding material.

4,692,567

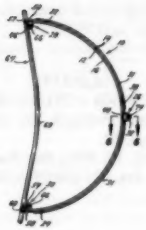
ELECTRIC FENCE HOLDER

Donald L. Crum, R.R. #4, Box 108, Carlinville, Ill. 62626

Filed May 14, 1985, Ser. No. 733,874
Int. Cl.[4] H01B *17/16;* **A01K** *3/00*
U.S. Cl. 174—158 F **10 Claims**

8. An electric fence holder for supporting an uninsulated electrically conductive wire from a fence wherein the fence is of the kind having parallel wire strands, comprising a flexible, resilient strap formed of electrical insulating material creating a bias toward a normally flat condition, the flexible strap having opposite ends and being yieldable to manual pressure applied toward the ends directed against a common side of the strap tending to shape the strap in the form of a bow moving the ends toward one another, means at the opposite ends of the flexible strap defining clamps for engaging two parallel wire strands of a fence upon moving the ends of the strap toward one another and projecting the apex of the bow created thereby laterally away from the existing fence, the means defining clamps comprising hooks at the ends of the strap, the hooks having concave closed sides and having openings opposite thereto toward a common face of the strap whereby the resilience of the strap when formed as a bow and attached to said two wire strands causes the closed sides of the hooks to bear against the said two parallel wire strands, and means on a face of the flexible strap at the apex of the bow for retaining the uninsulated electrically conductive wire comprising a transverse curvature defining a cavity in the strap with an open side

in a face of the strap, said common face being opposite the face having the open side of the cavity, whereby when the strap is



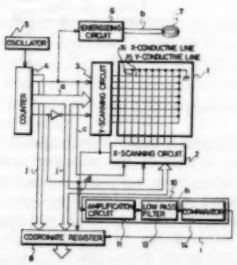
in the form of a bow as aforesaid, the opening of the cavity is restricted.

4,692,568

DIGITIZER USING PHASE INVERSION DETECTION SYSTEM

Yoshiyuki Morita, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed May 19, 1986, Ser. No. 865,075
Claims priority, application Japan, May 17, 1985, 60-105399
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 **3 Claims**



1. A digitizer using phase inversion detection system comprising:

a winding coil for generating magnetic field to indicate coordinate in response to an energizing signal,

a tablet having a plurality of conductive lines arranged in parallel with each other,

detection means for detecting phase inversion of an induction signal induced on said conductive lines,

counting means for measuring time interval between a starting time of selecting one of said conductive lines and a detecting time of phase inversion,

a scanning circuit for selecting one of said conductive lines in turn, said scanning circuit receiving a gate signal from said counting means at an input terminal thereof in synchronism with said energizing signal and including circuit means for selecting said one of conductive lines during existence of said gate signal, and

coordinate storing means for holding coordinate value.

4,692,569

AIRLINE ELECTRICAL GROUND CABLE FEED OUT AND RETRIEVAL STORAGE APPARATUS

Sol N. Winner, 28 Nassau Clr., Creve Coeur, Mo. 63141

Filed Apr. 4, 1983, Ser. No. 481,667
Int. Cl.[4] H02G *11/00*
U.S. Cl. 191—12 R **27 Claims**

1. An aircraft ground cable handling mechanism for use in the feed out, retrieval, and storage of an electrical cable, comprising, a storage compartment, a cable moving assembly housing, said storage compartment and assembly housing being in communication with each other, said assembly housing being arranged upwardly and extending forwardly of the said storage compartment, a pair of side walls forming the side walls for both the storage compartment and the assembly housing, a common upper wall for both the storage compartment and the assembly housing connecting to the said side walls, a back wall for the storage compartment connecting to the said side walls, a bottom wall for the storage compartment connecting to the said side walls, and a front wall for the storage compartment connecting to the side walls, said front wall arranged inclined towards the assembly housing for facilitating the feed out and retrieval of the ground cable from the said storage compartment during operation of the cable handling mechanism, a cable moving assembly provided within the assembly housing and when operative functioning to withdraw said cable from the storage housing for delivery to the aircraft or retrieving said cable for return into the said storage compartment, said cable moving assembly being disposed adjacent the storage compartment and substantially aligned therewith for delivery of a quantity of cable for unencumbered storage within the said compartment or withdrawal therefrom, said cable moving assembly being supported upon a base means, said base means being shiftably mounted between said pair of side walls and capable of at least partial removal therefrom to facilitate servicing of the cable moving assembly, said cable moving assembly including a pair of friction wheels aligned for biasing against said cable when arranged intermediate thereof, one of said friction wheels being shiftable with respect to the other wheel, and pressure biased in a direction towards the same to exert a pressure against said electrical cable arranged intermediate thereof, and a motor means operatively associated with the cable moving assembly for turning of at least one of the said friction wheels to achieve the said feed out or retrieval of the ground cable.

4,692,570
ELECTRIC SWITCH

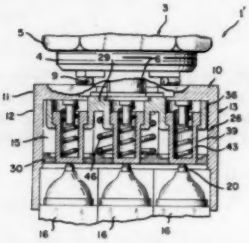
Reinhold Barlian, Dieselstr. 6, 6990 Bad Mergentheim; Martin Fischle, Bad Mergentheim, and Karl-Heinz Lux, Weikersheim, all of Fed. Rep. of Germany, assignors to Reinhold Barlian, Bad Mergentheim, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 746,974

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423177

Int. Cl.[4] H01H *9/00*

U.S. Cl. 200—4 **13 Claims**



1. An electric switch comprising a support frame;

key switching elements disposed in an inner space of the support frame and individually attachable to the support frame;

a pressure pin;

a compression spring;

a base body movable by the pressure pin against the force of the compression spring;

a bow spring;

an actuating front attachment mountable to a front plate and supported by the bow spring where the bow spring contacts the front plate;

two telescoping thrust journals supported by the base body;

two overthrow springs individually disposed at a corresponding thrust journal;

rams associated to the key switching elements and coordinated to the corresponding telescoping thrust journal via the overthrow springs; and

transmission means disposed in the inner space of the support frame below the plane of the bow spring and between a pressure pin of the actuating front attachment and the rams of the key switching elements, where the two thrust journals are joined to the transmission means.

4,692,571
PANEL ASSEMBLY WITH EASILY DETACHABLE SWITCH ACTUATORS

Vinh-Dinh D. Trinh, Arlington Heights; Ronald P. Scholtes, Cary, and Terence E. Sumner, Roselle, all of Ill., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Sep. 2, 1986, Ser. No. 902,909

Int. Cl.[4] H01H *9/02*

U.S. Cl. 200—5 A **14 Claims**

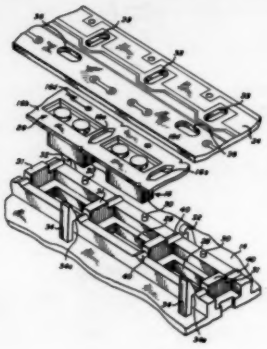
8. A front panel assembly modifiable at final assembly and intended for inclusion with associated electrical apparatus, comprising in combination:

a printed circuit board;

a control panel housing with means for mounting the associated PC board; and

an elastomeric key strip assembly having multiple switch assemblies with associated breakaway switch actuators mounted between said housing and PC board with each of said switch actuators extending through an associated opening in said housing for accessibility by a user,

said switch actuators being selectively and individually detachable by being pulled through said panel openings so



that the remaining switch assemblies conform to the options provided by said PC board.

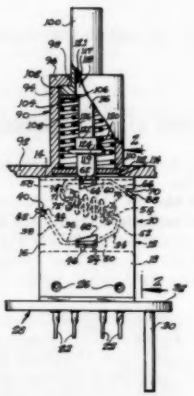
4,692,572
OVER-CENTER ACTUATOR SWITCH

James G. Heath, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 10, 1986, Ser. No. 827,896

Int. Cl.[4] H01H *5/00*

U.S. Cl. 200—17 R **19 Claims**



1. An over-center actuator switch assembly comprising base means having a pair of spaced apart walls, switch means mounted between said walls and having depressible switch operating means, a switch operating lever, means pivotally mounting said lever from said walls and engageable with said switch operating means to depress said switch operating means, a control lever, means pivotally mounting said control lever from said walls, compression spring means bearing against said control lever and said switch operating lever and normally biasing said control lever to a rest position and said switch operating lever to switch operating means depressing position, rest position means on said base means against which said control lever bears to establish rest position for said control lever, said control lever being pivotable away from rest position in response to an actuating force with said levers and said spring means thereupon moving through over-center position to pivot said switch operating lever to move said

switch operating means to non-depressed position and returning to its rest position upon removal of said actuating force.

4,692,573

INTERLOCK PUSH-PUSH SWITCH DEVICE

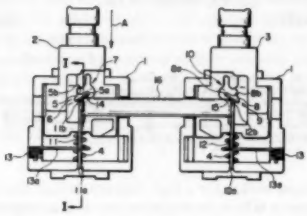
Takahiko Fukuyama, Gifu; Seiji Hori, Aichi; Yoshihiro Ota, and Yoshikazu Hayashi, both of Gifu, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Dec. 17, 1985, Ser. No. 809,738

Claims priority, application Japan, Dec. 17, 1984, 59-190994[U]; Dec. 21, 1984, 59-194883[U]

Int. Cl.⁴ H01H *9/20*

U.S. Cl. 200—50 C **6 Claims**



1. A switch device comprising:

a first base and a first operating piece having a portion received in said first base, said first operating piece being movable with respect to said first base between an actuated position and a release position;

a second base and a second operating piece having a portion received in said second base, said second operating piece being movable with respect to said second base between an actuated position and a release position;

means for biasing said first operating piece relative to said first base and said second operating piece relative to said second base to said respective release positions therefor;

a first cam part on said first operating piece including a first cam protrusion and a first cam groove, said first cam protrusion having a first cam surface inclined obliquely;

a second cam part on said second operating piece including a second cam protrusion and a second cam groove, said second cam protrusion having a second cam surface inclined obliquely;

a first lock pin having a first base portion received in said first base and a first top end portion adapted for movement in said first cam groove and engagement with and movement along said first cam surface during movement of said first operating piece between said release position and said actuation position thereof;

a second lock pin having a second base portion received in said second base and a second top end portion adapted for movement in said second cam groove and engagement with and movement along said second cam surface during movement of second operating piece between said release position and said actuated position thereof;

an operating member having a first end in abutment with said first lock pin and a second end in abutment with said second lock pin, said operating member for biasing said lock pin of one of said operating pieces to disenage said top end portion thereof from said cam protrusion of said cam part associated with said lock pin in response to the movement of the other of said operating pieces from said release position to said actuated position thereof; and

damage proof means for allowing said top end portion of said lock pin to move over said cam protrusion of said cam part.

4,692,574

DIFFERENTIAL PRESSURE RESPONSIVE SWITCH

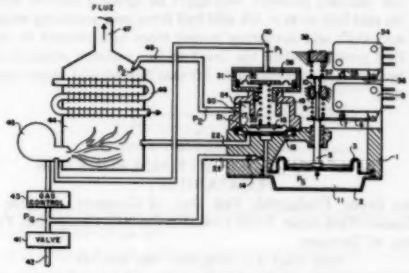
Hendrikus Berkhof, Emmen, Netherlands, assignor to Honeywell B.V., Amsterdam, Netherlands

Filed Apr. 21, 1986, Ser. No. 854,261

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521646

Int. Cl.⁴ H01H *35/32*

U.S. Cl. 200—81.5 **9 Claims**



1. A differential pressure responsive switch with an operating diaphragm having a position controlled by a pressure which is to be monitored and acting via a transmission member upon an electrical switch comprising

a first chamber divided by a control diaphragm,

an inlet means applying the pressure which is to be monitored to one side of said control diaphragm,

a bleed valve having a closure member carried by the other side of said control diaphragm and a valve seat,

a throttle means connecting the side of said valve seat which is opposite to said control diaphragm to a source of operating pressure,

pipe means connecting said side of said valve seat to a second chamber which is closed by the operating diaphragm and

a spring means engaging the transmission member and acting against the pressure acting on the operating diaphragm in said second chamber.

4,692,575

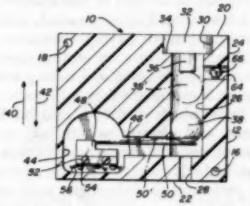
VACUUM SENSITIVE SWITCH

William J. Eberle, 2812 Riverlake Ct., Irving, Tex. 75060

Filed Feb. 10, 1986, Ser. No. 827,389

Int. Cl.⁴ H01H *35/34*

U.S. Cl. 200—82 C **4 Claims**



1. A switch responsive to vacuum pressure from a vacuum source, comprising:

(a) a body defining a chamber;

(b) a ball within said chamber and moveable between an upper position and a lower position therewithin;

(c) an electrical switch mounted on said body and having an actuating portion within said chamber and beneath said

ball and in contact with said ball when said ball is in said lower position, said actuating portion being resiliently biased upwardly to a first position and shifted by the weight of said ball to a second position when said ball is in said lower position; and

(d) means including an unobstructed conduit extending through said body from an upper end of said chamber to the outside of said body for continuously applying vacuum pressure to an upper portion of said ball, at all times regardless of whether the ball is rising or falling, whereby the vacuum pressure will exert an upward suction force on said ball so as to lift said ball from said actuating means and shift said actuating means from said second to said first position when the level of the vacuum pressure attains a value necessary to lift said ball to said upper position.

4,692,576

FLOAT SWITCH USING FOAM BODY FOR FLOATABILITY

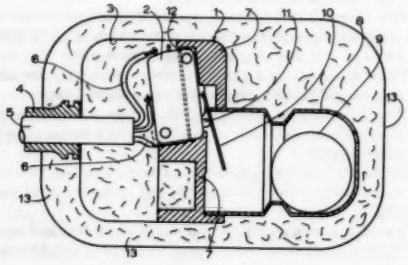
Dieter Frede, Ennigerloh, Fed. Rep. of Germany, assignor to Condor-Werk Gebr. Frede GmbH & Co. KG, Ennigerloh, Fed. Rep. of Germany

Filed May 27, 1986, Ser. No. 866,745

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 8516863[U]

Int. Cl.[4] H01H *35/18*

U.S. Cl. 200—84 R **5 Claims**



1. A float switch comprising

a holding and sealing component;

an electric switch accomodated in said holding and sealing component;

electric conductor means connected to said electric switch, including a current supply cable having an end portion situated at a connection zone and electric conductors extending from said end portion of said current supply cable through said connection zone to said electric switch and electrically connected to said electric switch;

means for actuating said electric switch, including a gravity actuation arrangement having a separate gravity switch body, said gravity actuation arrangement being also accomodated in said holding and sealing component; and

a float housing constituted solely by a body of a closed-pore integral foam which surrounds said holding and sealing component, said electric switch, said gravity actuation arrangement, and said electric conductors at said connection zone, and seals said connection zone against penetration of moisture therethrough, said separate gravity switch body having a relatively small air space compared to space occupied by said float housing,

whereby floatability in the sense of achievement of buoyancy is accomplished substantially only by said float housing, wherein said switch body has an open insertion end; wherein said holding and sealing component forms a receiving chamber receiving said electric switch and a receiving space receiving said switch body; and wherein said receiving chamber and said receiving space have respective end regions which communicate with one another to form a switching zone which is enclosed with respect to the interior; and additionally comprising means separately further sealing said end region of said receiving chamber for said electric switch in said holding and sealing component, including a circumferentially extending sealing lip on said holding and sealing component at said end region of said receiving chamber, which engages with a casing of said electric switch.

4,692,577

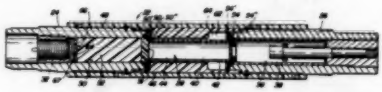
SWITCH FOR A HIGH-VOLTAGE INTERRUPTING MODULE

Roy T. Swanson, North Riverside, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Oct. 25, 1985, Ser. No. 791,178

Int. Cl.[4] H01H *33/06*

U.S. Cl. 200—151 **8 Claims**



1. An improved switch for a high-voltage device; the switch being of the type in which an insulative piston is arranged to be moved at high speeds from its normally located position in a more formed in a conductive member, away from the bore and into a passageway formed in an insulative liner, such movement of the piston moving a movable contact through the passageway and away from the conductive member to break an electrical interconnection between the conductive member and the movable contact and to form a gap therebetween, thereby opening the switch; the bore and the passageway being aligned; wherein the improvement comprises the provision of energy-absorbing means for inhibiting rebounding of the piston from the movable contact, said energy-absorbing means comprising an element disposed between the piston and the movable contact, said element including interstices and being crushed in response to forces transmitted from the piston to the movable contact.

4,692,578

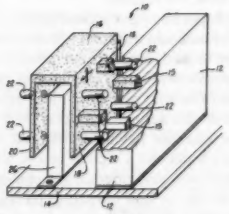
UNIVERSAL MATRIX SWITCHING DEVICE

John E. Wallace, Athens, Ala., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 758,783, Jul. 25, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 9,027

Int. Cl.[4] H01H *63/00, 67/00;* **H02B** *1/02;* **H04Q** *1/02*

U.S. Cl. 200—175 **2 Claims**



1. In a universal matrix switching device including a matrix board having a plurality of pins disposed for axial movement in respective transverse apertures in said board for selective electrical contact with transversely-spaced conductor strips disposed in said board and exposed for contact in said apertures, a position table associated with said board for selectively

moving in a plane parallel to said board, actuator means for selectively axially moving said pins into and out of electrical contact with said strips, and control means for selectively controlling said position table and said actuator means, the improved actuator means comprising:

a plurality of unidirectional linear actuators disposed in two planar arrays on opposite sides of said matrix board, each said actuator including a rod disposed for selective axial movement between positions retracted from and extended toward said matrix board, and

means operatively connected to said position table for supporting said actuators in said planar arrays at an axial distance from said matrix board such that when said rods are in said retracted positions said supporting means is moveable relative to said matrix board and when said rods are moved into said extended positions, axially-aligned pins in said matrix board are axially moved in said apertures for selective electrical contact with said conductor strips, said pins in said matrix board being axially moved in one direction by actuator rods in one said planar array and axially moved in the other direction by actuator rods in the other said planar array.

4,692,579

ELECTRON BEAM LITHOGRAPHY APPARATUS

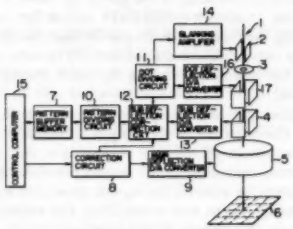
Norio Saitou, Iruma; Susumu Ozasa, Kashiwa; Masahide Okumura, Sagamihara; Mitsuo Ooyama, Hachioji; Tsutomu Komoda, Nishitama; Katsuhiro Harada; Minpei Fujinami, both of Tokyo, and Kazumi Iwadate, Higashimurayama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Corporation, both of Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,184

Claims priority, application Japan, May 18, 1984, 59-98675; May 18, 1984, 59-98676; May 18, 1984, 59-98677

Int. Cl.[4] H01J *37/00*

U.S. Cl. 250—492.2 **7 Claims**



1. An electron beam lithography apparatus comprising:

means for generating a spot beam;

means for exposing a desired pattern onto a wafer using said spot beam to form said pattern as dots on said wafer;

means for dividing said pattern into small regions;

main deflecting means for deflecting said spot beam to one of a plurality of sub-fields dividing a field to be exposed on said wafer;

sub-deflecting means for deflecting said spot beam and for designating an origin of said small region in said sub-field; and

dot deflecting means for digitally scanning and for fully exposing the portion inside said small region by a fixed correction amount by use of said spot beam.

4,692,580

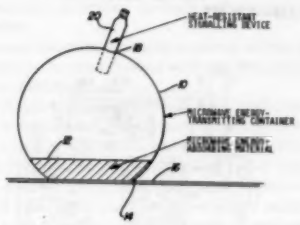
MICROWAVE OVEN WARNING DEVICE

Ronald D. L. Bell, 28 Keewatin Crescent, Nepean, Ontario, Canada K2E 6Z1

Filed Apr. 14, 1986, Ser. No. 851,945

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 M **1 Claim**



1. A process for preventing damage to a microwave oven comprising the steps of:

providing a device which is operative in response to receipt of microwave energy to absorb the microwave energy for a predetermined period of time and also generate a warning signal; and

placing the warning device in the empty microwave oven when the oven is not in use so that in the event of accidental or unintended switching on of the oven the warning device operates to absorb the microwave energy for said predetermined period of time to avoid damage to the oven for said predetermined period of time and also operates to produce a warning sound to alert the operator that the oven is operating so that the oven may be turned off to avoid damage to the oven beyond said predetermined period of time.

4,692,581

CONDENSATION RESISTANT ELECTRODE FOR USE IN A DIELECTRIC HEATING APPARATUS

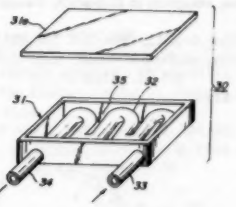
Isao Mizutani, Nagoya and Akio Enomoto, Chita, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 3, 1986, Ser. No. 835,364

Claims priority, application Japan, Mar. 12, 1985, 60-34064[U]

Int. Cl.[4] H05B *6/54*

U.S. Cl. 219—10.81 **3 Claims**



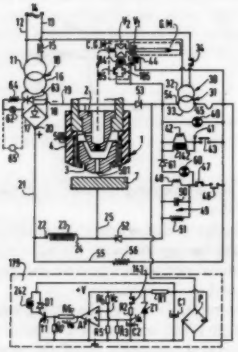
1. A dielectric heating apparatus comprising a pair of oppositely located electrodes; a means for supplying electrical power to said electrodes; at least one of the electrodes including a zigzag tube inside thereof, said zigzag tube having, one inlet opening and one outlet opening, wherein a heated fluid enters only from the inlet opening and exits the interior portion only from the outlet opening, such that said at least one electrode is heated by radiant energy emitted from said zigzag tube to prevent condensation on the electrode.

4,692,582

PLASMA WELDING OR CUTTING SYSTEM PROVIDED WITH A DELAY

Gérard Marhic, Cergy, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 18, 1986, Ser. No. 830,112
Claims priority, application France, Feb. 22, 1985, 85 02554
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PT **12 Claims**



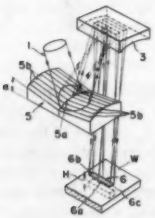
1. A gas-cooled plasma welding or cutting system comprising: a torch including a torch body, at least one electrode mounted in said body and a nozzle having a gas outlet orifice; gas supply means for providing said torch with plasma-producing gas; and electrical supply means for producing, maintaining or breaking a plasma welding or cutting arc, wherein said nozzle is axially movable relative to said torch body between an arc-producing position in which it engages the electrode and a normal operation position spaced from the electrode and is provided with elastic return means elastically yielding the nozzle towards its normal operation position, said return means comprising a gas flow, said system further comprising means for providing a maximum gas flow during a cutting operation which is responsive to the breaking of said arc to at least reduce said gas flow after a predetermined period of time following said arc breaking.

4,692,583

SURFACE HEAT TREATING APPARATUS

Seiichiro Kimura, Koganei, and Hidekazu Aoki, Tachikawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 12, 1986, Ser. No. 895,735
Claims priority, application Japan, Aug. 12, 1985, 60-177196
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 L **3 Claims**



1. A surface heat-treating apparatus in which an emitted laser beam is reflected and focused into a heat-treating area formed on a surface of a workpiece, comprising:

a composite cylindrical segment mirror made of two convex-cylindrical segment mirrors joined together so as to have a V-shaped configuration; and

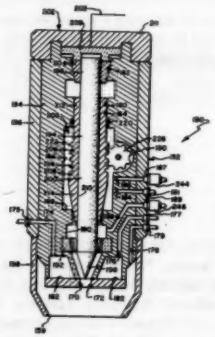
a concave cylindrical mirror located on a path of a laser beam reflected by said composite cylindrical segment mirror fopr focusing the laser beam on the surface of the workpiece.

4,692,584

GAS CONTROL SYSTEM FOR A PLASMA ARC WELDING APPARATUS

Clifford Caneer, Jr., Rte. 2, Box 24A, Cornersville, Tenn. 37047

Filed Nov. 29, 1985, Ser. No. 802,984
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—121 PU **5 Claims**



1. In automatically-controlled plasma arc welding apparatus including a plasma torch positionable in operative relationship with a workpiece for working thereon and control means including a gas slope valve controlling various welding parameters such as plasma gas slope, the torch including a body defining a flow passage for plasma gas and an orifice through which plasma gas exits the torch as a high-temperature jet stream, the improvement comprising:

the operative positioning of the gas slope valve in relatively close flow proximity to the torch orifice for controllably regulating the flow of plasma gas through the torch orifice between two preselected flow rates to thereby accurately control the plasma gas exiting the torch during a welding operation,

pressure-sensing means associated with the gas flow line for sensing the pressure of plasma gas immediately upstream and downsteam of the gas slope valve and generating signals corresponding to the sensed pressure and

control means for sensing the signals generated by the pressure-sensing means and controlling the various welding parameters in response to the received signals.

4,692,585

APPARATUS FOR A-C ARC WELDING WITH A CONSUMABLE ELECTRODE

Igor I. Zaruba; Vladimir V. Dymenko, and Viktor I. Bolotko, all of Kiev, U.S.S.R., assignors to Institute Electrosvarki Imeni Patona, Kiev, U.S.S.R.

Filed Nov. 12, 1986, Ser. No. 930,550
Int. Cl.[4] B23K *9/06*
U.S. Cl. 219—130.4 **1 Claim**

1. An apparatus for a-c arc welding with a consumable electrode, comprising;

a welding transformer, a secondary winding of said welding transformer being connected to an electrode gap;

a first pulse generator;

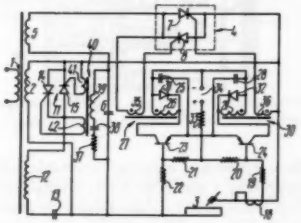
a power circuit of said first pulse generator connected in parallel with said electrode gap and having a series circuit including a thyristor switch having control inputs, a power supply winding, and a switched capacitor;

a control unit for controlling said thyristor switch of said first pulse generator;

a zero detector of said control unit connected in parallel with said electrode gap, and an output of said zero detector;

a control pulse former of said control unit having an input connected to said output of said zero detector and outputs connected to said control inputs of said thyristor switch;

a second pulse generator;



a power circuit of said second pulse generator connected in parallel with said electrode gap and having a series circuit including a thyristor switch having control inputs, a power supply winding, and a switched capacitor;

a control unit for controlling said thyristor switch of said second pulse generator;

a zero detector of said control unit fo said thyristor switch of said second pulse generator connected in parallel with said switched capacitor of said power circuit of said first pulse generator, and an output of said zero detector;

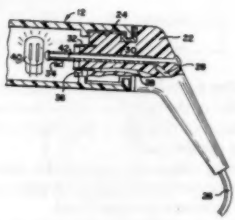
a control pulse former of said control unit of said thyristor switch of said second pulse generator having an input connected to said output of said zero detector and outputs connected to said control inputs of said thyristor switch of said second pulse generator.

4,692,586

PILOT LIGHT ARRANGEMENT FOR STYLING IRON WITH SWIVEL CORD

George R. Fromm, Glenview, and Philip S. Stefaniak, Hanover Park, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Filed Jun. 6, 1986, Ser. No. 871,361
Int. Cl.[4] A45D *1/04*
U.S. Cl. 219—225 **6 Claims**



5. A pilot light arrangement for a hand-holdable electrical appliance having a housing, comprising:

a swivel cord mount rotatably connected to said housing for rotation relative thereto about an axis;

a pilot light positioned within said housing for indicating supply of electrical power to said appliance;

first and second generally tubular, concentrically arranged electrically conductive members, said first and second conductive members being connected to said swivel cord mount for rotation therewith, with the axes of said conductive members arranged generally coaxially with said axis of rotation of said swivel cord mount, said first conductive member extending through said second conductive member;

first and second electrical contacts mounted within housing for respective electrical contact with said first and second conductive members; and

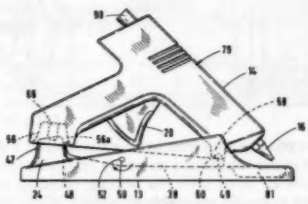
fiber optic means extending through said first conductive member in said swivel cord mount generally along said axis of rotation of said swivel cord mount, said fiber optic means having one end positioned in operative association with said pilot light, and an opposite end positioned at the exterior of said swivel cord mount, whereby operation of said pilot light is visible from the exterior of said appliance by light transmission through said fiber optic means;

4,692,587

HAND TOOL AND SUPPORT

John W. Spirk, Jr., 50 Stonewood Dr., and John R. Nottingham, 60 Stonewood Dr., both of Moreland Hills, Ohio 44022

Filed Feb. 19, 1986, Ser. No. 831,720
Int. Cl.[4] H05B *3/42*
U.S. Cl. 219—242 **34 Claims**



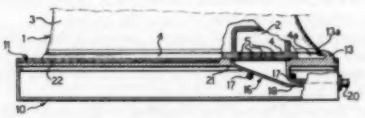
1. A support for releasably securing a hand tool thereto, comprising a post having means for engaging a portion of a hand tool thereon, and releasing means for applying a force to the portion of a hand tool engaged with said post for disengaging the portion of the hand tool from said post, said releasing means comprising a lever having a first end disposed adjacent said post, and said lever being pivotally mounted in a manner that enables said first end to exert a prying force on a portion of the hand tool engaged with said post.

4,692,588

STEAM GENERATING APPARATUS FOR DIFFERENT HOUSEHOLD APPLICATION OUTLETS

Alfredo Cavalli, Via Galileo Galilei, 9, Pessano con Bornago (Milano-Italy), Italy

Filed Apr. 5, 1985, Ser. No. 720,403
Claims priority, application Italy, Apr. 6, 1984, 21467/84[U]
Int. Cl.[4] D06F *75/08*
U.S. Cl. 219—245 **10 Claims**



1. A steam generating apparatus for different household application outlets, said apparatus comprising:

a steam jet iron having an ironing plate formed with steam delivery orifices,

a steam manifold removably associated with said ironing plate at said orifices,

sealing means interposed between said steam manifold and said ironing plate,

a steam delivery conduit hydraulically connected to said steam manifold, and

thermostat-controlled heating means associated with said steam manifold.

4,692,589

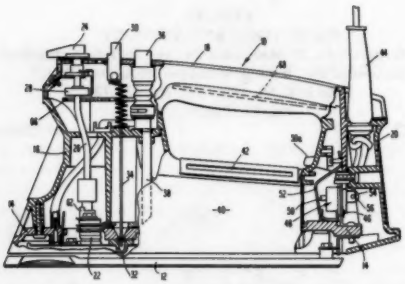
ELECTRIC IRON HAVING SAFETY CUTOFF SWITCH AND TEMPERATURE INDICATOR

Allen S. Borsari, Hamden; Stanley J. Brym, Torrington, both of Conn.; Laura A. Markure, Framingham, Mass., and Ronald G. Arpino, Branford, Conn., assignors to Hamilton Beach Inc., Waterbury, Conn.

Filed Feb. 5, 1986, Ser. No. 826,228

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—251 **6 Claims**



1. An electric pressing iron having a soleplate, a main heating element in the soleplate, a manually resettable thermostatic cutoff switch in series with the heating element, said cutoff switch being manually resettable externally of the iron, a control circuit including a heating resistor mounted on the cutoff switch, an orientation responsive switch and a timing circuit including a capacitor which charges when the circuit is energized, whereby when said orientation responsive switch because of lack of movement of the iron fails to discharge the capacitor for a preset period of time, the heating resistor is activated to trigger said cutoff switch opening the main heating element of the iron.

4,692,590

AROMA-GENERATING AUTOMOBILE CIGARETTE LIGHTER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Continuation-in-part of Ser. No. 835,223, Mar. 3, 1986, which is a continuation-in-part of Ser. No. 658,778, Oct. 9, 1984, Pat. No. 4,574,181. This application Oct. 14, 1986, Ser. No. 918,141

Int. Cl.[4] F22B *1/28*; A61L *9/03*; F23Q *7/00*

U.S. Cl. 219—275 **6 Claims**

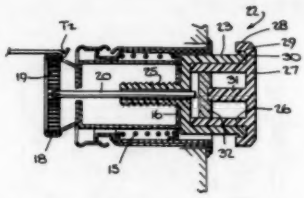
1. A cigarette lighter adapted to function also as an aroma generator, the lighter being insertable into a socket having terminals which are connected to a power source, one of which is a latching bi-metallic element, said lighter comprising:

A. a cylindrical case that fits into the socket;

B. a spring-biased hollow plunger formed from a cylindrical shell telescopically received in the case, said plunger being provided with a rear end closure plate having a center hole therein;

C. an electrical heater unit attached to the front end of the shell and which in the inactive state of the plunger lies within the case, the unit having a center contact and an outer contact, whereby when a user presses in the plunger to activate the lighter, the contacts are engaged by the socket terminals to energize the unit and the unit is then latched by the latching element which engages the outer contact, the resultant heat also acting to deform the latching element, thereby disengaging the terminals and causing the released plunger to return to its inactive state;

D. a cylindrical cage secured to the rear of the plunger and having an outer cage diameter somewhat smaller than the inner diameter of said case, said cage being provided at its base with a hollow plug that projects into the center hole in the rear end closure plate of the plunger;



E. a hollow cylindrical cartridge insertable into said cage and supporting a heat-responsive, aroma-generating element that is activated by heat to exude an aromatic vapor; and

F. a thermally conductive electrode rod forming the center contact of the unit and extending through the plunger and the hollow plug into the hollow cartridge to a point adjacent said element to transfer heat thereto when the lighter is activated.

4,692,591

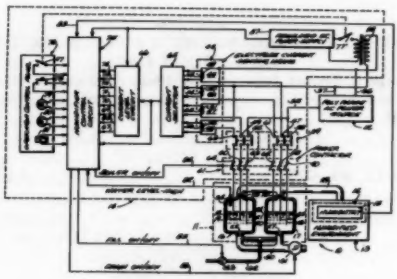
HUMIDIFIER CONTROLLER HAVING MULTIPLE-PHASE ELECTRODE CURRENT SENSOR

Stephen E. Cooley, and Martin J. Jensen, both of Madison, Wis., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Mar. 21, 1986, Ser. No. 842,639

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—295 **20 Claims**



1. A controller for regulating the operation of an electronic steam humidifier of the type having an electrode boiler operable from a source of polyphase electrical alternating current, said controller comprising:

current sensing means for sensing the current provided to the electrode boiler through each phase of the polyphase electrical alternating current; and

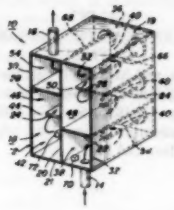
control means responsive to the highest of the individual phase currents sensed by said current sensing means for developing a control effect in response to said highest individual phase current reaching a predetermined threshhold.

4,692,592

COMPARTMENTALIZED ELECTRIC LIQUID HEATER

Hemant D. Kale, 5145 N. Kenton Ave., Chicago, Ill. 60630

Continuation-in-part of Ser. No. 583,052, Feb. 23, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 774,049
Int. Cl.[4] F24H *1/14*
U.S. Cl. 219—298 8 Claims



1. A compartmentalized, storage-tank-type, electric heater for heating liquids, having a reduced recovery time, comprising:

a housing;

a plurality of partition panels wholly disposed within the housing to form a plurality of compartments, each partition having flow passage means for fluid communication with only the immediately adjacent compartment(s);

said flow passage means disposed wholly within the housing;

a fluid inlet in a first upstream compartment disposed within the housing;

a fluid outlet in a final downstream compartment disposed within the housing;

heating means in the housing for heating fluid in at least some of the compartments;

automatic thermostatic control(s) to maintain the fluid temperature; and,

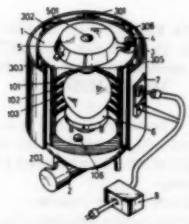
said automatic thermostatic control(s) electrically wired to shift heating output from at least one compartment to at least one other compartment, said automatic thermostatic control(s) progressively shifting heating output from upstream compartments to downstream compartments during withdrawal of fluid and progressively shifting heating output from downstream compartments to upstream compartments when fluid withdrawal stops so that all of the heating means are not energized simultaneously thereby limiting maximum energy usage to a preselected amount.

4,692,593

DOMESTIC ELECTRIC KILN

Chui-Wen Chiu, 7f, No. 27, Lane 330 Tun Hwa S. Rd., Taipei, Taiwan

Filed Jan. 25, 1985, Ser. No. 694,780
Int. Cl.[4] F27D *7/02*
U.S. Cl. 219—362 2 Claims



1. A domestic electric kiln which can also be used as an ordinary electric radiator comprising:

a double walled housing having a heated inner chamber;

a cover with an opening in the center thereof;

safety lock means for normally preventing removal of the cover during operation of the kiln;

a water pipe set beneath the bottom of the kiln for generating steam and having three openings, the first one being the water inlet, the third one being a heat conducting block seated in one opening of the water pipe and being in communication with the heated inner chamber to thereby supply heat to the water pipe to generate steam, and the third one being the steam outlet;

a supporting rack which also facilitates the spread of steam throughout the inner chamber;

means for allowing air to circulate between the double walls which serves as an air cooling mechanism; and

a temperature regulator,

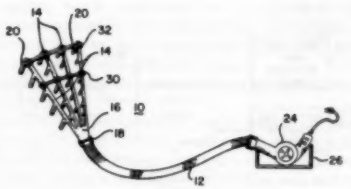
both steam and hot air being in continuous flow in the kiln chamber.

4,692,594

APPARATUS FOR DRYING HAIR FROM THE INSIDE OUT

Jack Martin, 434 Rahway Ave., Woodbridge, N.J. 07095

Filed Oct. 31, 1985, Ser. No. 793,207
Int. Cl.[4] H05B *1/00*; A45D *20/00, 24/00*
U.S. Cl. 219—373 9 Claims



1. Apparatus for drying hair from the inside out, comprising:

a supply tube adapted for connection to a source of air;

a plurality of feeder tubes in communication with said supply tube;

a plurality of fingers extending from each of said feeder tubes, each of said fingers being in communication with and extending from differing portions of respective ones of said plurality of feeder tubes and having a distal end and a length sufficient for supporting said plurality of feeder tubes at locations which for the most part are removed from said hair, and each finger having a plurality of openings for permitting air from the source to dry the hair from the inside out;

adjustment belt means connecting to said plurality of feeder tubes for maintaining said feeder tubes in an established spaced relationship; and

fastener means cooperating with at least selected ones of said plurality of feeder tubes and said adjustment belt means for individually and selectively varying the spacing of said selected ones of said plurality of feeder tubes within said established spaced relationship.

4,692,595

ELECTRICALLY OPERATED HEATING ELEMENT FOR A HOT-RUNNER TOOL

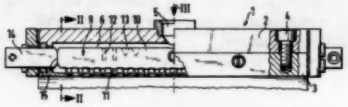
Walter Muller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH & Co., Herford, Fed. Rep. of Germany

Division of Ser. No. 653,990, Sep. 24, 1984, Pat. No. 4,631,389. This application May 7, 1986, Ser. No. 860,593

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335296; Sep. 29, 1983, 3335294; Nov. 7, 1983, 3425518

Int. Cl.[4] B29C *45/74, 45/30;* H05B *3/06*

U.S. Cl. 219—421 10 Claims



1. In an electrically operated heating element for a hot-runner tool that has a heat conductor and is positioned in a hot runner and in runners that derive from the heat conductor and lead to a series of outflow channels from the hot-runner tool, the improvement wherein the heat conductor comprises a flat body with tongues on the side toward the outflow channels, each tongue extending to the vicinity of one outflow channel and further comprising recesses in the flat body above each tongue.

4,692,596

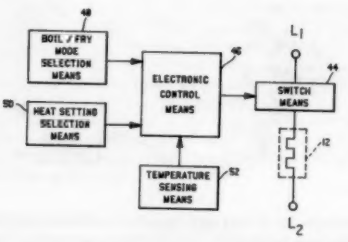
POWER CONTROL ARRANGEMENT FOR AUTOMATIC SURFACE UNIT

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 6, 1986, Ser. No. 816,616

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—450 7 Claims



1. In a cooking appliance of the type including at least one surface unit for supporting and heating a cooking utensil placed thereon and adapted for energization by an external power supply, temperature sensing means for sensing the temperature of a utensil supported on the surface unit, user operable input selector means enabling a user to select a FRY mode, and to select for the FRY mode one of a plurality of different heat settings, each heat setting having associated with it a predetermined steady state temperature range defined by a predetermined minimum and maximum temperature and electronic control means responsive to the temperature sensing means and the input means for controlling energization of the temperature sensing means and improvement wherein said electronic control means comprises:

means for establishing first and second error signals as functions of the difference between the sensed temperature and the selected steady state temperature range; and

means operative to control energization of the surface unit as a function of the first error signal during the transient heat up phase prior to the sensed utensil temperature first reaching the steady state temperature range and as a function of the second error signal during the steady state phase after the sensed utensil temperature first reaches the steady state temperature range, whereby tighter control of the utensil temperature during the steady state phase is achieved while maintaining minimal overshoot in the transient heat up phase.

4,692,597

HEATING APPLIANCE WITH UNIFORM HEATING CONTROL

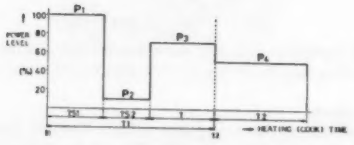
Tatsuya Tsuda, Osaka, and Masako Nogi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1985, Ser. No. 808,486

Claims priority, application Japan, Dec. 14, 1984, 59-265071

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—492 5 Claims



1. A heating appliance comprising:

(a) heating means having at least a first, a second, a third and a fourth power level for heating an object, said heating means applying heat to the object during each power level, said third power level being greater than said second power level, said fourth power level being lower than said first power level;

(b) sensor means for sensing the heating condition of said object and outputting a signal representative thereof;

(c) detecting means, responsive to said output signal of said sensor means, for detecting whether said object has been heated to a predetermined heat completion condition;

(d) switching means for switching from said first power level to said second power level to said third power level of said heating means prior to the detection of said predetermined heat completion condition of said object being heated; and

controlling means for controlling said heating means to provide an additive heating period at the fourth power level for heating said object after said detecting means detects that said predetermined heat completion condition has been reached, said additive heating period being determined by the type of said object and the length of time from the start of said heating to the detection of said heating completion condition.

4,692,598

TEMPERATURE CONTROLLER SYSTEM

Naoki Yoshida, Sagamihara, and Nobutoshi Kobayashi, Tokyo, both of Japan, assignors to Yamato Scientific Co., Ltd., Tokyo, Japan

Division of Ser. No. 526,267, Aug. 25, 1983. This application Feb. 14, 1986, Ser. No. 829,715

Claims priority, application Japan, Oct. 16, 1982, 57-181778

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 2 Claims

1. For use with a heater connected in series with a power source and arranged in a chamber or the like to maintain the temperature in said chamber at a selected level, a temperature controller comprising:

a temperature sensor in said chamber;

a temperature setting means adapted to be set at said selected level;

a main comparator circuit for developing an OFF-control output when the detected output of said temperature

sensor is higher than the output of said temperature setting means;

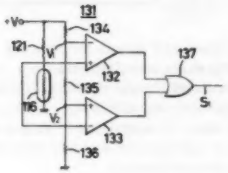
a sub-comparator circuit for developing an OFF-control output when the detected output of said temperature sensor exceeds an overheating level which is higher than said selected level;

a control output circuit for emitting an "AND" output signal of the output signal of said main comparator circuit and said sub-comparator circuit as the OFF-control output for a switch which is connected in series with said heater and said power source;

a temperature judging circuit for detecting a malfunction of said temperature sensor;

a temperature setting means judging circuit for detecting a malfunction of said temperature setting means; and

a switch circuit for interrupting the supply of power from



said power source to said heater when a malfunction is detected by either of said judging circuits;

said temperature setting means judging circuit comprising a third comparator for judging a disconnection;

first and second resistors connected in series between said power source and ground;

third and fourth resistors connected in series between said power source and ground;

means for applying a divided voltage obtained at a connection point between said first and second resistors to the negative input terminal of said third comparator; and means for applying a divided voltage obtained at the connection point between said third and fourth resistors to the positive input terminal of said third comparator, whereupon the output of said third comparator constitutes the output of said temperature setting means judging circuit.

4,692,599

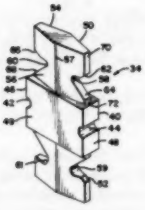
COIL SUPPORT INSULATOR FOR AN ELECTRIC HEATER

H. Keith Howard, and Jimmy L. Sherrill, both of Cookeville, Tenn., assignors to Tutco, Inc., Cookeville, Tenn.

Continuation of Ser. No. 597,701, Apr. 6, 1984, Pat. No. 4,559,412, which is a division of Ser. No. 206,899, Nov. 14, 1980, Pat. No. 4,458,141. This applicat... Oct. 8, 1985, Ser. No. 785,595

Int. Cl.[4] H05B *3/06*; H01B *17/56*

U.S. Cl. 219—532 **6 Claims**



1. An electric heater comprising an elongate structural member and an insulator means for supporting a heater coil, wherein said insulator means comprises an integral elongate element having at least one notch therein adapted to support said heater coil by engaging at least one individual convolution thereof, said insulator having groove means in an exterior surface engaging said structural member, said structural member comprising an elongate rod at least partially encircling said insulator means and recieve in said groove means to support said insulator means.

4,692,600

SYSTEM AND METHOD FOR AUTOMATIC TRANSACTION

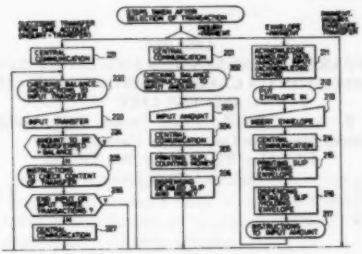
Kenichi Takahashi, Niigata, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,702

Claims priority, application Japan, Jul. 31, 1984, 59-159060

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—379 **10 Claims**



1. A system for automatic transactions, comprising:

a medium reader for receiving an inserted medium from a customer and for reading data from said medium in which information identifying said customer is recorded;

a operation unit provided with transaction selection keys comprising single transaction and combination keys to input transactions of different kinds in combination, and a numerical key to input numerical values and personal code number of said customer;

a display unit for displaying instructions for operation to said customer; and

a control unit for performing a single transaction based on data read by said medium reader and of said selection keys, and for performing a plurality of different transactions based on data read from said medium and said combination keys, in repsonse to one insertion of said medium to said medium reader and one input of the personal code number by said customer.

4,692,601

IDENTIFICATION CARD INCLUDING SWITCHING MEANS FOR BUILT-IN BATTERY

Harumi Nakano, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,938

Claims priority, application Japan, Mar. 25, 1985, 60-42777[U]

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—380 **12 Claims**

1. An identification card comprising:

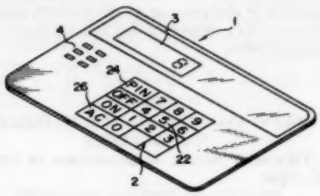
a built-in type battery;

means for processing data necessary for the identification card;

storage means for storing at least said data upon being energized by said battery;

first switching means interposed between said battery and said storage means; and

switching control means, energized by said battery, for controlling said switching means to be turned off in a first condition and to be turned on in a second condition in response to a command signal externally supplied via said



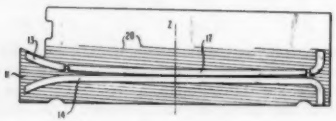
identification card to said switching control means, whereby said storage means is not energized by said battery in the first condition, but is energized in the second condition.

4,692,602

APPARATUS FOR SENSING AND/OR WRITING INFORMATION ON CARDS, PASSPORTS AND CHECKS AND THE LIKE

Curtis T. Conant, Rancho Palos Verdes, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Filed May 23, 1985, Ser. No. 737,198
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—446 **5 Claims**



1. A multimedia apparatus for writing and/or reading information on a medium and adapted to accept media of different thicknesses, first and second rail means spaced apart from one another in opposition in a manner to define an acceptance slot of maximum width therebetween, said apparatus also including a wear plate against a first surface of which the edge of a medium is urged when passed through said acceptance slot, at least a portion of said first surface including striations of a depth and at an angle to said opposing rail means.

4,692,603

OPTICAL READER FOR PRINTED BIT-ENCODED DATA AND METHOD OF READING SAME

Robert L. Brass, Westport; John Glaberson, Stratford; Richard W. Mason, Cos Cob; Arthur J. L'Heureux, III, Bethel; Scott Santulli, Danbury; G. Thomas Roth, Fairfield, all of Conn.; John Frega, Holmdel, and Henry S. Imiolek, Clark, both of N.J., assignors to Cauzin Systems, Incorporated, Waterbury, Conn.

Filed Apr. 1, 1985, Ser. No. 718,219
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—454 **70 Claims**

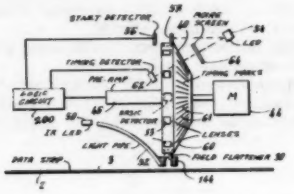
1. An apparatus for scanning data encoded in bit form on a planar data strip, said data strip having a series of data lines of bit areas running transversely across said strip, said data lines being parallel to, contiguous with, and conterminous with, each other, whereby the totality of said lines defines the length of said strip, said encoded data being sequentially encoded along each said data line and thereafter along the contiguous said data line,

said apparatus including,

a chassis adapted to be positioned proximate to said data strip,

a first cylindrical lens mounted on said chassis parallel to the plane of said data strip and parallel to said data lines, and means for moving said chassis longitudinally of said strip,

at least one second cylindrical lens mounted in said chassis parallel to the plane of said data strip and perpendicular to



said data lines, and means for moving said second lens transversely along said first lens,

a detector mounted on said chassis at the focal point of said lenses relative to said data strip,

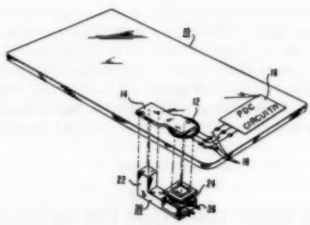
whereby bit areas on a given said data line are focused in sequence on said detector and said data lines are focused in sequence on said detector.

4,692,604

FLEXIBLE INDUCTOR

Robert L. Billings, Andover, Mass., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 25, 1984, Ser. No. 664,555
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—493 **11 Claims**



1. In combination with a portable data card having at least one electronic device, a flexible inductor for converting transmitted magnetic energy into electric energy to energize said electronic device comprising a flat electrically conductive multiturn coil and a flexible magnetic and nonmagnetrostrictive core piece attached to said card to direct said transmitted magnetic energy through said coil.

4,692,605

SYSTEM FOR FINE FOCUSING A CAMERA ON A MOVING CURVED SURFACE

Frank S. Krufka, Mount Joy, Pa., assignor to RCA Corporation, Princeton, N.J.

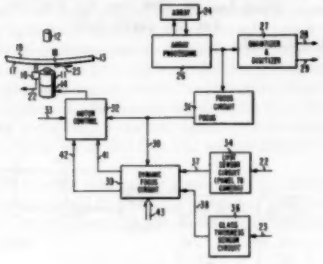
Filed Feb. 24, 1986, Ser. No. 832,129
Int. Cl.[4] G03B *3/10*; G01N *21/00*; H04N *17/00*
U.S. Cl. 250—201 **8 Claims**

1. A system for fine focusing a lensing mechanism on one surface of a curved transparent object as said object moves with respect to said lensing mechanism whereby the distance between the other surface of said object and said lensing mechanism varies, said system comprising:

displacement transducer means for providing a displacement

signal representative of the distance between said other surface and said lensing system;

thickness transducer means for providing a thickness signal representative of the thickness of said object; and



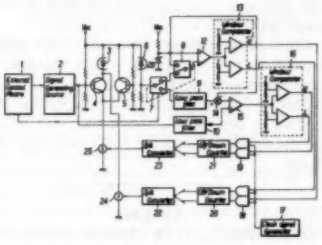
focusing circuit means, responsive to said displacement signal and to said thickness signal, for fine focusing said lensing mechanism in accordance with changes in said displacement and thickness signals.

4,692,606

MODULATED LIGHT SOURCE WITH POWER STABILIZED ACCORDING TO DATA SIGNAL

Mitsugu Sakai, and Shoji Yoshikawa, both of Hachioji, Japan, assignors to Olympus Optical Company, Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,911
Claims priority, application Japan, Oct. 9, 1984, 59-212357
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **11 Claims**



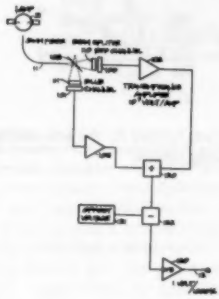
1. An optical power stabilizing device for generating stabilized light power comprising a light source for generating light power having switchable light emitting quantities of a first level and a second level larger than the first level, a photodetecting means coupled to said light source for detecting at least a part of the light power of said light source to generate a photodetected signal, means for driving said light source, a signal source for generating input signals, means for generating at least one control reference signal by processing said input signals, a first feedback loop control circuit for feeding back to said means for driving said light source the output of said photodetecting means at the light power of said first level by comparing it with said control reference signal, and a second feedback loop control circuit for feeding back to said means for driving said light source the output of said photodetecting means at the light power of said second level, said second feedback loop control means comprising first low-pass filter means for filtering said photodetected signal, second low-pass filter means for filtering said input signals, a subtractor means connected to said first low-pass filter means for subtracting the output thereof from the control reference signal, and a differential amplifier connected to said subtractor means and said second low-pass filter means for comparing the output of said subtractor and the output of said second low-pass filter means.

4,692,607

CONTROLLED COLOR LIGHT SOURCE

John T. LaBelle, Long Beach; David A. Pringle, Pacific Palisades, both of Calif., and Daniel McKenna, Kahuku, Hi., assignors to Optech Inc., Burbank, Calif.

Filed Oct. 25, 1985, Ser. No. 791,215
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **13 Claims**



1. A controlled color high intensity light source comprising:

(a) a lamp for projecting a beam of light, said lamp being installed in an enclosure, said enclosure having an opening through which said beam projects;

(b) a power supply external of said enclosure for energizing the lamp;

(c) a light fiber for sampling a portion of the light emitted from the lamp, said fiber having one end thereof located inside said enclosure adjacent said lamp and another end external of said enclosure;

(d) a beam splitter arranged to split the light from the fiber into two channels;

(e) a pair of photo detectors, one for each channel arranged to receive the light from said another end of the fiber via the beam splitter;

(f) a divider circuit having a pair of inputs and an output, the inputs being connected to the two photo detectors;

(g) output means connected to the output of the divider for providing an output signal which is proportional to the color of light captured by said fiber; and

(h) means for controlling said power supply in response to said output means to automatically adjust the color of light projected by said lamp.

4,692,608

COMPACT OPTICAL IMAGING SYSTEM

David H. Cooper, Saratoga, Calif.; Makoto Toyota, and Satoshi Arakawa, both of Omiya, Japan, assignors to Fuji Photo Optical Company, Ltd., Uetake, Japan

Filed May 18, 1984, Ser. No. 611,618
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 **23 Claims**

1. A compact optical imaging system comprising:

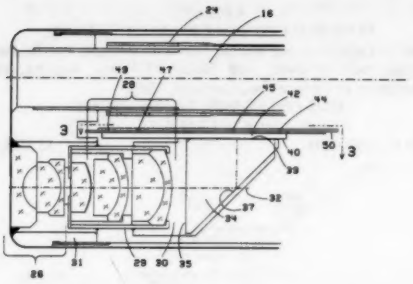
a lens assembly for gathering and focusing light from objects within the field of view of the lens;

an image-forming sensor having a signal output corresponding to the intensities and colors of patterns of light falling on the sensor, oriented in a plane other than perpendicular to the optical axis of the lens assembly;

means for directing light from the lens assembly to cause the light to strike the image-forming sensor, and;

means for supporting the lens assembly, light directing

means and image-forming sensor such that the image-forming sensor is placed in the focal plane of



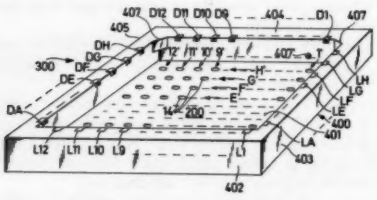
the optical system formed by the lens assembly and the light directing means.

4,692,609

METHOD AND APPARATUS FOR INDICATING AND SENSING PIPETTING POSITIONS

Ingvar Pettersson, Sundbyberg, Sweden, assignor to Scomas AB, Sundbyberg, Sweden

Filed Jun. 9, 1986, Ser. No. 872,008
Claims priority, application Sweden, Jun. 18, 1985, 8503027
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 **15 Claims**



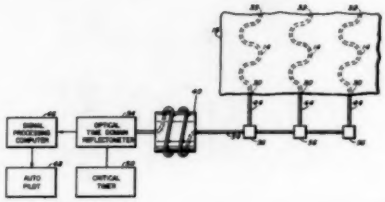
8. Apparatus for indicating and sensing pipetting positions in a pipetting sequence which is manually performed at a test plate (**100**) having a matrix of wells (**114**), characterized by a station (**400**) which is arranged to receive the test plate (**100**) in a predetermined orientation and a predetermined position, an illumination device (**200**) in the station for distinguishing illumination of the rim (**115**) of a well (**114**) at which a pipetting operation is to be performed, a program control means (**600**) which previously has been programmed for a certain pipetting sequence and which is arranged to control the illumination means (**200**) to illuminate that well (**114**) in the test plate (**100**) at which a pipetting operation shall be carried out according to the sequence, a sensing means (**300**) in the station for sensing the position for a pipette which is inserted in a well, and a comparison means (**700,800**) for comparing the position of the illuminated well (**114**) and the sensed pipette position, said comparison means (**700,800**) being arranged, if the compared positions coincide, to bring the program control means (**600**) to initiate the next sequence step or, if the positions do not coincide, to emit an alarm triggering signal.

4,692,610

FIBER OPTIC AIRCRAFT LOAD RELIEF CONTROL SYSTEM

Nicholas C. Szuchy, Babylon, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 30, 1986, Ser. No. 824,124
Int. Cl.[1] G01N *3/00*
U.S. Cl. 250—227 **14 Claims**



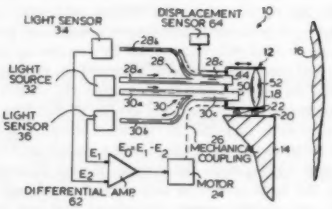
1. A fiber optic load measuring system comprising:
(a) an optical pulse generator;
(b) an optical bus connected to said optical pulse generator;
(c) a plurality of optical pulse routing switches serially disposed along the length of said optical bus;
(d) a plurality of optical attenuators, each of said optical attenuators being disposed along a dedicated surface where an applield load is to be measured, each of said optical attenuators further being connected to a dedicated optical pulse routing switch and being operative to vary the attenuation of the optical pulse in response to the applied load as said optical pulse is reflected by said optical attenuators;
(e) said optical pulse routing switches being operative to selectively direct said optical pulses to individual optical attenuators such that each of said optical attenuators is separately pulsed;
(f) an optical pulse receiver connected to said optical bus and operative to receive optical pulses reflected from said optical attenuators; and
(g) a signal processor connected to said optical receiver and operative to process the signal received by said optical pulse receiver to determine the load along each of said surfaces.

4,692,611

FIBER OPTIC PROXIMITY SENSOR WITH FEEDBACK SERVO IMAGING MEANS

Leo Hoogenboom, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,600
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 **8 Claims**



1. A proximity sensor for determining a distance to a target comprising:
a light source;
first and second bifurcate bundles of optical fibers;

first and second light detectors for generating first and second detected sensor signals corresponding to the light intensities detected by the detectors;

imaging means;

said first and second bundles having respective first and second front faces and being positioned and arranged to direct light from said light source to said target through said imaging means and to transmit reflected light from said target to the first and second sensors respectively to generate sensor signals which have equal amplitudes when said bundles are at a preselected distance from the target;

means for generating a control signal corresponding to the difference between said first and second detector signals; and

means for moving said imaging means in accordance with said control signal for tracking said target while maintaining a constant distance between said faces and said imaging means.

4,692,612

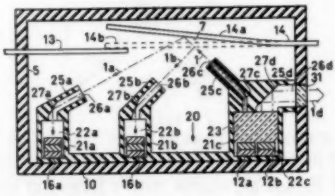
SWITCH POSITION DETECTOR AND INDICATOR WITH MULTICOLOR LIGHT EMITTER

Karel Havel, 15 Kensington Road, Apartment #704, Bramalea, Ontario, Canada L6T 3W2

Filed Jun. 13, 1986, Ser. No. 874,028

Int. Cl.[4] G01D *5/34*; H01J *1/56*

U.S. Cl. 250—229 **14 Claims**



1. The method of indicating a position of a contact element movable among a plurality of positions in a switching device, said contact element including a reflecting surface, by:

directing on said reflecting surface of said contact element a multicolor light beam capable of illuminating in one of a plurality of different colors;

obtaining from said contact element a reflected light beam having a direction in accordance with the position of said contact element;

determining the direction of said reflected light beam; and

controlling the color of said multicolor light beam in accordance with the direction of said reflected light beam to thereby indicate the position of said movable contact element.

4,692,613

ANGLE SENSOR

Sumio Masuda, Tokyo; Hiroshi Iiyama, and Kazuyuki Tamura, both of Kanagawa, all of Japan, assignors to Jeco Co., Ltd., Kawasaki, Japan

Filed Apr. 17, 1985, Ser. No. 724,092

Claims priority, application Japan, Apr. 24, 1984, 59-81212

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **6 Claims**

1. An angle sensor comprising:

a horizontal shaft rotated by an object at a rotation angle which is to be measured;

a disc shaped light shielding member penetrated by said shaft at a center thereof, rotated about said shaft and formed with a spiral slit, a distance between said slit and an axis of said shaft increasing uniformly from a first slit end to a second slit end, said first and second slit ends being first and second distances from said shaft, respectively, said second distance being greater than said first distance;

a light source for illuminating one side of said light shielding member;

a single linear light receiving means which is capable of determining a longitudinal position thereof on which a light beam from said light source strikes, said linear light receiving means being disposed on the opposite side of said light source with respect to said light shielding member in such manner that a longitudinal axis line of said light receiving means coincides with a line which is orthogonal to and includes the axis of said shaft and is parallel to the surface of said light shielding member, said linear light receiving means having a predetermined length so that when said light shielding member is rotated by said object, light passing through said first and second slit ends each are received, respectively, by opposite end portions of said light receiving means; and

a weight coupled to said light shielding member.

4,692,614

ROTATIONAL MOTION FLUID LOOP SENSOR USING MAGNETICALLY LEVITATED DETECTING ELEMENT

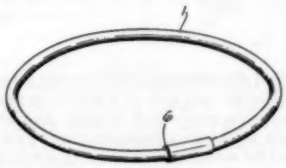
David J. M. Wilson, and Paul E. G. Cope, both of Hampshire, England, assignors to The Marconi Company Limited, England

Filed Apr. 23, 1986, Ser. No. 855,184

Claims priority, application United Kingdom, Apr. 27, 1985, 8510771

Int. Cl.[4] G01P *15/00*

U.S. Cl. 250—231 R **9 Claims**

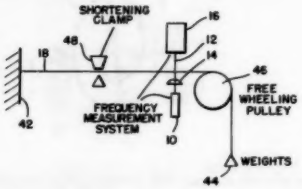


1. A rotational motion sensor comprising a fluid loop and a piston to act as the detecting element which is magnetically levitated to keep it from direct contact with any part of the sensor other than the fluid itself, and which moves in proportion to the motion of the element of fluid it substitutes and which behaves in all dynamical respects to high accuracy as a damped simple harmonic oscillator with respect to the body and tube of the sensor.

4,692,615
APPARATUS AND METHOD FOR MONITORING TENSION IN A MOVING FIBER BY FOURIER TRANSFORM ANALYSIS

Thomas O. Mensah, Big Flats; Dale R. Powers, Painted Post, and Clement D. Burton, Ithaca, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,750
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 R **16 Claims**



8. Apparatus for monitoring the tension in a moving fiber comprising:

(a) means for sensing the motion of the fiber in a direction transverse to the direction in which the fiber is moving;

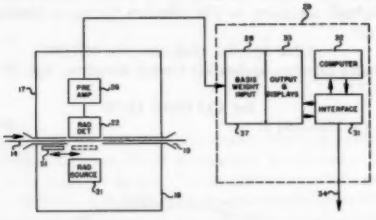
(b) means for analyzing the sensed motion to determine at least one frequency component thereof, said means performing a Fourier transform to determine said at least one frequency component of the sensed motion of the fiber; and

(c) means for monitoring the frequency component so determined so as to monitor the tension in the fiber.

4,692,616
BASIS WEIGHT GAUGE STANDARDIZING METHOD AND SYSTEM

Philip Hegland, San Jose, and Lee Chase, Los Gatos, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Mar. 14, 1984, Ser. No. 589,607
Int. Cl.[4] G01D *18/00*
U.S. Cl. 250—252.1 **8 Claims**



1. A method of standarizing a basis weight gauge for measuring the weight per unit area of a sheet material, such gauge having a radiation source and radiation detector with a gap therebetween for directing radiation along a path towards said material and for detecting the amount of radiation transmitted through said material, said transmitted radiation being a measure of the basis weight of said material, said gauge also including standard means having a predetermined and stable basis weight and movable to be interposed in said radiation path, said method comprising the following steps:

(a) constructing two calibration curves each showing basis weight on a first axis versus a function of transmission ratio on a second axis, the first calibration curve being constructed without simulated dirt and the second calibration curve being constructed with simulated dirt;

(b) constructing a standardization curve by plotting the displacement of one calibration curve relative to the other

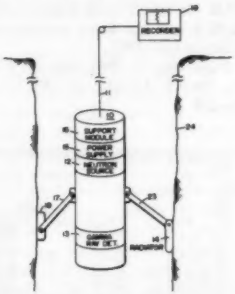
(c) operating the gauge to measure the weight per unit area of the sheet material by determining a measured transmission ratio;

(d) standardizing the gauge during operation, the standardizing step including determining a correction factor C, based upon the value of the standardization curve at a point corresponding to the measured transmission ratio.

4,692,617
METHOD AND SYSTEM FOR NEUTRON LIFETIME LOGGING

Linus S. Allen, Dallas; William R. Mills, Jr., Duncanville, and David C. Stromswold, Addison, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,599
Int. Cl.[4] G01V *5/10*
U.S. Cl. 250—270 **14 Claims**



1. A method for neutron lifetime logging of subterranean formations surrounding a borehole, comprising the steps of:

(a) positioning a radiator having a neutron absorbing and gamma ray radiating material in juxtaposition with the borehole wall,

(b) shielding said radiator from neutron radiation from the borehole fluid, such that the directional sensitivity of said radiator is maximized with respect to secondary formation neutron radiation and is minimized with respect to borehole neutron radiation,

(c) irradiating the formations surrounding the borehole with bursts of fast neutrons,

(d) absorbing secondary formation neutron radiation entering the borehole from the irradiated formations with said radiator,

(e) radiating neutron capture gamma rays from said radiator in response to absorption of said secondary formation neutron radiation by said radiator, and

(f) detecting said neutron capture gamma rays as a measure of the neutron lifetime characteristic of the formations surrounding said borehole.

4,692,618
DETECTOR SIGNAL CONDITIONER

Robert W. Klatt, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 2, 1985, Ser. No. 729,825
Int. Cl.[4] G01J *5/26*
U.S. Cl. 250—330 **9 Claims**

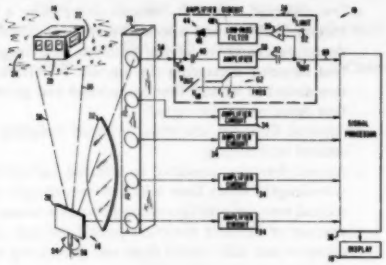
1. An imaging system comprising:

means for scanning radiation from a subject to be imaged, said scanning means including a set of detectors of the radiation;

a set of amplifying circuits connected by AC coupling to corresponding ones of said detectors; and

means coupled to said amplifying circuits for extracting imaging data to provide an image of said subject;

said amplifying circuits each including means for limiting the



magnitude of an output signal of said corresponding one of said detectors, and a feedback branch for operating said limiting means to limit a signal amplitude of said one detector to a preset limit value.

4,692,619

PYROELECTRIC TYPE DETECTING DEVICE

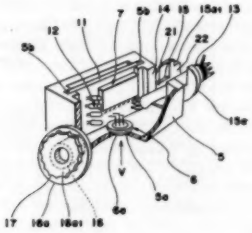
Noboru Masuda, Kawaguchi; Kenji Tomaki, Kawasaki; Tetsuo Oosawa, Tokyo, and Michihiro Murata, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 19, 1986, Ser. No. 876,182

Claims priority, application Japan, Jun. 20, 1985, 60-93838[U]

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—338 4 Claims



1. A pyroelectric type detecting device comprising:

a converging mirror including a mirror member;

a pyroelectric type sensor element for detecting light converged by said converging mirror, which has a window for receiving the light;

an amplifier for amplifying an output signal of said sensor element into an amplified signal and outputting the amplified signal at a low impendance; and

a casing for accommodating said sensor element and said amplifier therein;

said casing being rotatably mounted on a portion of said converging mirror such that said window of said sensor element confronts said mirror member of said converging mirror.

4,692,620

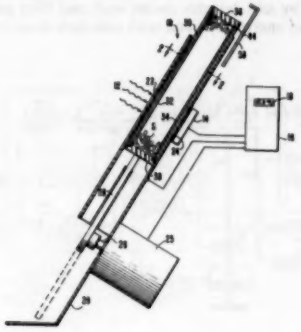
NEAR INFRARED MEASURING INSTRUMENT WITH SAMPLE HOLDER

Robert D. Rosenthal, Gaithersburg, Md., assignor to Trebor Industries, Inc., Gaithersburg, Md.

Filed May 31, 1985, Ser. No. 739,679

Int. Cl.[4] G01N *21/03, 21/35*

U.S. Cl. 250—343 15 Claims



1. A near infrared measuring instrument for measuring a constituent of a material, the instrument being of the type having a source of near infrared radiation, a detector for near infrared radiation, a means for holding a sample between the source and the detector, and means for data processing connected to the detector to read the detector and measure a constituent in a sample of the material by the amount of near infrared radiation transmitted through the sample, with the improvements comprising:

(a) means for providing a plurality of different predetermined uniform thicknesses of samples to be measured, comprising at least one cuvette for holding a sample between the source and the detector, the cuvette having opposing faces with at least a portion thereof being transparent to near infrared radiation, the cuvette providing at least one predetermined uniform thickness between the source and the detector in order to hold a predetermined uniform thickness of sample,

(b) means for moving the cuvette relative to the near infrared radiation source and the detector and for stepwise placing a plurality of locations of the radiation-transparent portion of the cuvette and the at least one predetermined uniform thickness of sample into relative stationary alignment between the source and the detector,

(c) means for reading the detector when the cuvette is stationary, and

(d) means in the cuvette for measuring the temperature of the sample.

4,692,621

DIGITAL ANESTHETIC AGENT ANALYZER

Robert E. Passaro, Richmond; Kevin G. Williams, Pinole; George K. Parnoff, Walnut Creek, and Raymond E. Rogers, Oakland, all of Calif., assignors to Andros Anlayzers Incorporated, Berkeley, Calif.

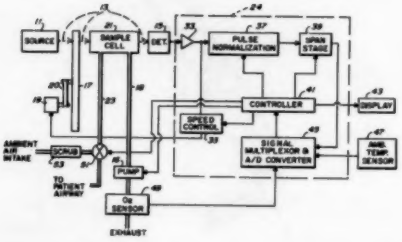
Filed Oct. 11, 1985, Ser. No. 786,736

Int. Cl.[4] G01N *21/35*

U.S. Cl. 250—343 6 Claims

1. A gas analyzer comprising, a sample cell for containing a gas mixture to be analyzed, source means for producing and directing infrared energy through said sample cell, a rotary filter wheel having at least one filter thereon for passing infrared energy limited to a wavelength band within the characteristic absorption band of a predetermined gas and having a dark level region substantially opaque to infrared energy, drive

means for supporting and rotating said filter wheel to successively interpose said filter and said dark level region between said source means and said sample cell in the path of the infrared energy directed by said source means, detector means for detecting infrared energy passing through said sample cell and producing an electrical signal representative thereof, signal processing means connected to said detector means for producing an output indicating the concentration of the predetermined gas in the sample cell by comparing the electrical signals produced by said detector means with said filter positioned in the infrared energy path and with said dark level regions positioned in the infrared energy path, said filter wheel including a second filter for passing first and second infrared wavelength bands, one of which is within a region of infrared absorption by water vapor and the other of which is not, both of said first and second wavelength bands of said second filter being outside the characteristic wavelength absorption regions of other gases present in the sample cell, the amplitude of transparency of said second filter at each of said first and second infrared wavelength bands being selected to track the variation in absorption of infrared energy at the wavelength of said first filter due to the presence of water vapor in said sample cell.

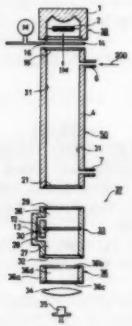


4,692,622

INFRARED ANALYZER

Harutaka Taniguchi, and Takafumi Fumoto, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd. and Fuji Electric Corporate Research and Development Ltd., both of Kanagawa, Japan

Filed Dec. 3, 1985, Ser. No. 803,967
Claims priority, application Japan, Dec. 4, 1984, 59-255900
Int. Cl.[4] G01N *21/37*
U.S. Cl. 250—343 **6 Claims**



1. An infrared analyzer comprising;

a source of infrared radiation;

a measurement cell for receiving material to be analyzed and transmitting said radiation therethrough, said material containing a first component which absorbs infrared radiation of a first wavelength and a second component which absorbs infrared radiation of a second wavelength;

an infrared detecting means, said detecting means including

a first detector, said first detector comprising a first detecting chamber and a second detecting chamber, said detecting chambers having different path lengths, said first detector measuring the amount of infrared radiation absorbed by said first component and generating a first detector output signal;

an optical filter for absorbing infrared radiation of said second wavelength;

a second detector, sensitive to infrared radiation in the wavelengths other than said first wavelength and said second wavelength, said second detector measuring the amount of infrared radiation passed through said first detector and said optical filter and generating a second detector output signal; and

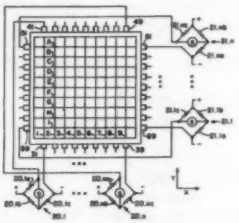
means for using the first and second detector output signal to determine the concentration of said first component in said material.

4,692,623

PRECISION LASER BEAM POSITIONER AND SPATIALLY RESOLVED LASER BEAM SAMPLING METER

Thomas G. Roberts, Huntsville; Raymond W. Conrad, Russellville; William F. Otto, Huntsville, and Thomas E. Honeycutt, Somerville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 13, 1986, Ser. No. 835,826
Int. Cl.[4] G01K *17/00*
U.S. Cl. 250—349 **11 Claims**



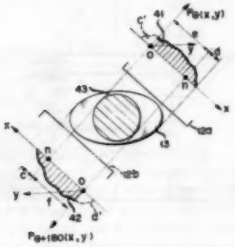
1. An analyzer for an energy beam comprising a first set of plurality of wire resistors arranged on a substrate such that they present a plurality of straight line segments each in a horizontal plane and parallel to each other, a second set of plurality of wave resistors located on the substrate positioned behind said first set of wave resistors such that they present a plurality of straight line segments in a plane and parallel to each other, said resistors being positioned on said substrate such that the beam will impinge on at least a portion of said resistors so as to cause heating of said resistors and therefore a change in the resistance in accordance to the power output of the beam and its position relative to said resistors and a plurality of measuring means individually connected to different ones of said wire resistors for measuring the resistance of each resistor.

4,692,624

EMISSION COMPUTED TOMOGRAPHY APPARATUS

Takashi Ichihara, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 10, 1986, Ser. No. 850,048
Claims priority, application Japan, Apr. 11, 1985, 60-78029
Int. Cl.[4] G01T 1/164
U.S. Cl. 250—363 S 2 Claims



2. An emission computed tomography apparatus comprising:

a radiation detector for detecting radiation from a subject dosed with radioisotope while moving along an elliptical orbit about said subject, said radiation detector having a predetermined effective field of view to detect perpendicularly incident radiation, said predetermined effective field of view being reduced because a region where radiation emitted from said subject in 360-degree directions can be detected is restricted due to said elliptical orbit of said radiation detector;

an image reconstruction section responsive to said radiation detector for reconstructing a tomogram representing radiation distribution in said subject; and

a display unit for displaying an image reconstructed by said image reconstruction section;

said radiation detector having a first effective field-of-view region and a second effective field-of-view region at each of first and second positions opposed to each other with the subject interposed therebetween, said first effective field-of-view region at each of said first and second positions detecting radiation emitted from the same part of said subject, said second effective field of view of said detector at said first position detecting radiation emitted from part of said subject outside the effective field of view of said radiation detector at said second position, and said second effective field-of-view region at said second position detecting radiation emitted from part of said subject outside the effective field of view of said radiation detector at said first position;

said image reconstruction section being arranged to perform an arithmetic operation given by

$$K1 \cdot P2a + (P2b + P1b) + K2 \cdot P1c$$

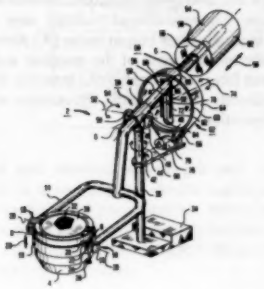
where P1b represents radiation information detected by said first effective field-of-view region of said radiation detector at said first position, P1c represents radiation information detected by said second effective field-of-view region of said radiation detector at said first position, P2b represents radiation information detected by said first effective field-of-view region of said radiation detector at said second position, P2a represents radiation information detected by said second effective field-of-view region of said radiation detector at said second position, and K1 and K2 represent coefficients.

4,692,625

DETECTOR HEAD MOUNTING MECHANISM AND SUPPORTING STRUCTURE

George J. Hanz, Bloomingdale, Ill.; Guenter Jung, Roettenbach, and Michael Pflaum, Aisch, both of Fed. Rep. of Germany, assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Jun. 24, 1985, Ser. No. 747,731
Int. Cl.[4] G01T 1/20
U.S. Cl. 250—363 R 25 Claims



1. A mechanism for mounting a detector head including a collimator, comprising:

(a) a supporting structure supporting the detector head including the collimator, said supporting structure having a single trunnion axis for the detector head;

(b1) a shifting means for shifting the detector head including the collimator and the supporting structure with respect to each other in a manner that the detector head including the collimator is balanced with respect to the single trunnion axis,

(b2) the shifting means including a slider housing and a slider slidably inserted in the slider housing, wherein

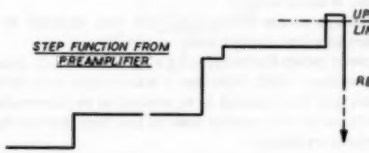
(b3) one is secured to the supporting structure in the single trunnion axis and the other one is secured to the detector head.

4,692,626

NUCLEAR AND X-RAY SPECTROMETRY AND LOW-PASS FILTER AND FILTERING METHOD THEREFOR

Georg P. Westphal, Schmidlergasse 7, A-1238 Wien, Austria

Filed Jun. 20, 1985, Ser. No. 747,137
Claims priority, application Austria, Jun. 20, 1984, 2021/84; Feb. 15, 1985, 454/85
Int. Cl.[4] G01T 1/17
U.S. Cl. 250—389 12 Claims



1. In a method of measuring the energy of a quantum of nuclear of X-ray radiation in which said radiation liberates electric charge by ionization in a detector, the liberated electrical charge which is proportional to the adsorbed energy of the radiation quanta is transformed into energy proportional voltage steps in a preamplifier and the preamplifier output is subjected to filtering in a low-pass filter to reduce the effect of

electronic noise from the preamplifier, the improvement which comprises:

(a) before beginning the measurement of a voltage step of a quantum setting a storage element of said low-pass filter at a starting voltage value corresponding substantially to an unfiltered value of the voltage step of the quantum to preload said low-pass filter to an amplitude of signals represented by said quantum;

(b) terminating the measurement of the energy of said quantum no later than the arrival of the next quantum; and

(c) forming as the energy-proportional measured value of the quantum a noise-reduced voltage step difference (B−A) by storing a filter output value (A) directly before beginning the measurement of the quantum and subtracting the stored filter output value (A) from the filter output value (B) directly following the termination of the measurement operation.

4,692,627

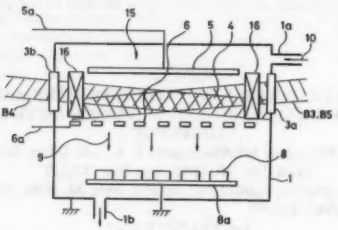
ION BEAM GENERATOR

Yoshihiro Ueda; Kouichi Ono; Tatsuo Oomori, and Shigeto Fujita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,541

Int. Cl.⁴ H01J *37/08, 27/24*

U.S. Cl. 250—423 P **30 Claims**



1. An ion beam generator, which comprises:

an ion generating section for wherein a first material to be ionized is introduced;

gas discharge means for exciting said first material to be ionized to a low excited state;

light source means for introducing a light into the ion generating section which light has a wavelength such that it excites said first material to be ionized to an intermediate state from the low excited state of said first material by a resonance excitation;

a pair of electrodes for generating a first electric field for ionizing said first material excited to said intermediate state using the Stark effect; and

material support means for supporting a second material to which ions produced by the ionizing of said first material are irradiated, said material support means being heard as an electrode for generating a second electric field in cooperation with one of said pair of electrodes, said second electric field introducing said ions to said material.

4,692,628

PIPELINE SWITCH

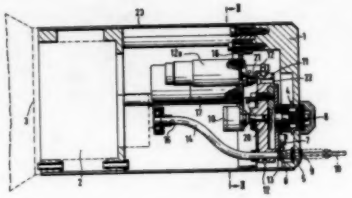
Kurt Sauerwein, Kattendahl 7, 4006 Erkrath 2; Norbert Kinzer, Wuppertal, both of Fed. Rep. of Germany, and Felix W. Mick, Bronx, N.Y., assignors to Kurt Sauerwein, Erkrath, Fed. Rep. of Germany

Continuation of Ser. No. 532,580, Sep. 15, 1983, abandoned. This application Oct. 30, 1985, Ser. No. 798,158

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313857

Int. Cl.⁴ G21F *5/02*

U.S. Cl. 250—497.1 **5 Claims**



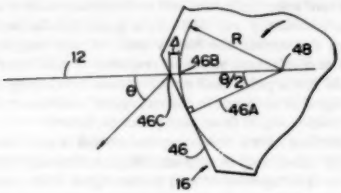
1. A pipeline switch apparatus for use in a radiation transfer environment including a radiation shielded afterbody device for holding a radiation source capsule located within said afterbody device in readiness for use, a radiation source head connected to said afterbody device, a loading pipe connected at one end to said head, a cable connected to said radiation source capsule for guiding the capsule from said afterbody device through said head into said loading pipe, a plurality of secondary pipes spaced from said loading pipe and arranged so that a selected one of said secondary pipes can receive said radiation source capsule, wherein the improvement comprises a housing enclosing said radiation source head and said loading pipe, a first plate rigidly secured to said housing and located between said loading pipe and said secondary pipes, said first plate having a plurality of spaced through-holes therethrough each arranged to be aligned with a different one of said secondary pipes, means for interconnecting said through-holes and said secondary pipes, said interconnecting means comprises hollow plug-connectors mounted in said through-holes in said first plate and engaged with said secondary pipes, said through-holes being centered about and spaced radially outwardly from an axis extending perpendicularly through said first plate, a second plate located within said housing between said afterbody device and said first plate and disposed parallel to said first plate and being rotatable about an axis coaxial with the axis through said first plate about which said through-holes are centered, said loading pipe is secured rigidly at the other end thereof in a loading pipe conduit hole in said second plate so that said loading pipe rotates with said second plate for alignment with said interconnecting means and a selected one of said through-holes in said first plate, recesses formed in said second plate and arranged concentrically about the axis of said second plate, drive means for rotating said second plate around the axis thereof, said drive means arranged for rotating said second plate relative to said first plate for interconnecting said loading pipe to one of said secondary pipes whereby a radiation source capsule can be introduced from said afterbody device through said radiation source head and said loading pipe and then through one of said plug-in connectors into one of said secondary pipes, safety switching means actuable by said interconnecting means so that without actuation said safety switching means prevents the displacement of said radiation source capsule from said afterbody device through said second plate when said loading pipe is not aligned with one of said through-holes in said plate, and locking means engageable with said second plate for securing said second plate against rotation when said loading pipe is aligned with one of said through holes in said first plate.

4,692,629

OPTICAL TYPE MEASURING SCANNER

Taizo Nakamura, Mitaka, Japan, assignor to Mitutoyo Mfg., Co., Ltd., Japan

Filed Jun. 10, 1985, Ser. No. 742,785
Int. Cl.[4] G01N *121/86*
U.S. Cl. 250—560 4 Claims



1. An optical measuring device wherein:

said device comprises a parallel scanning light beam generator including a polygonal rotary mirror for reflecting an incident light beam from a beam generator into a rotary scanning light beam and a collimator lens for converting said rotary scanning light beam into a parallel scanning light beam, said rotary scanning light beam being incident upon an inlet side of the collimator lens and said parallel scanning light beam exiting from an outlet side of the collimator lens, said collimator lens having a focal point between said inlet side and said polygonal rotary mirror for light passing through said collimator lens from the inlet side to the outlet side, and

a light receiving element for detecting bright and dark portions of said parallel scanning light beam, which was scanned a work to be measured, and

a time duration of the dark portion or the bright portion is detected, which has been generated by the obstruction of a part of said parallel scanning light beam by said work to be measured interposed between said parallel scanning light beam generator and said light receiving element, to thereby determine a dimension of said work to be measured in the scanning direction;

characterized in that when $\theta/2$ is an angle of rotation between a normal line to a reflecting surface of said polygonal rotary mirror and an optical axis of the incident light beam and R is a distance on said normal line between the reflecting surface and a rotary center of said polygonal rotary mirror, said collimator lens is an $f\theta$ lens having a spherical aberration such that a light beam incident upon the outlet side of said collimator lens and directed toward said polygonal rotary mirror parallel to an optical axis of said collimator lens intersects the optical axis of said collimator lens at a position shifted from said focal point an amount Δ, wherein $\Delta = R/\cos(\theta/2) - R$.

4,692,630

WAVELENGTH SPECIFIC DETECTION SYSTEM FOR MEASURING THE PARTIAL PRESSURE OF A GAS EXCITED BY AN ELECTRON BEAM

Carl A. Gogol, Cazenovia, N.Y., assignor to Inficon Leybold-Heraeus, E. Syracuse, N.Y.

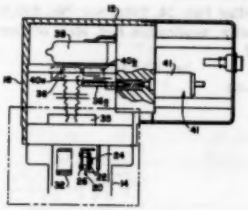
Filed May 27, 1986, Ser. No. 867,093
Int. Cl.[4] H01J *27/00*
U.S. Cl. 250—573 11 Claims

1. A sensor for measuring the relative amount of a specific gas within a vacuum chamber comprising:

electron beam generating means providing in a given direction a beam of electrons having sufficient energy to excite the atoms and molecules of said gas whereby said atoms and molecules exite photons indicative of said gas,

means in communication with said chamber for conducting said gas to said electron beam,

photodetector means for viewing photons emitted by said atoms and molecules, the photodetector means having a predetermined viewing direction from which said photons are received, and including discriminating means for selecting the photons of said wavelength and excluding others, and means for detecting the intensity of the photons of said selected wavelength and converting said intensity to a proportional electric signal; and



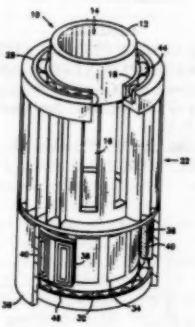
means mounting said photodetector means relative to said electron beam generating means so that the viewing direction of said photodetector means is substantially orthogonal to said electron beam.

4,692,631

TURBINE ALTERNATOR WITH A CENTRAL CLEAR OPTICAL PATH

Randy L. Dahl, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 4, 1986, Ser. No. 892,552
Int. Cl.[4] F01D *15/10*; H02K *21/12*; H02P *9/04*
U.S. Cl. 290—55 7 Claims



1. A tubine alternator with a central clear optical path comprising:

a hollow, cylindrical center tube defining said central clear optical path;

a hollow, cylindrical assembly of turbine blades including a lower cylinder rotatably mounted on said center tube;

at least one magnet mounted on the periphery of said lower cylinder of said assembly of turbine blades; and

wire windings fixedly positioned about said magnets.

4,692,632

PROCEDURE AND APPARATUS FOR UNINTERRUPTIBLE POWER SUPPLY

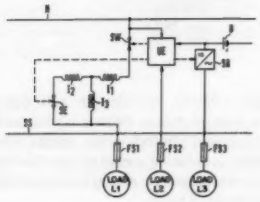
Hartmut Gaul, Roettenbach; Hermann Mickal, Erlangen, and Adolf Haboeck, Roettenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 24, 1986, Ser. No. 832,925

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 3506572

Int. Cl.[4] H02J *9/06*

U.S. Cl. 307—66 **11 Claims**



1. A procedure for an operation of uninteruptible power supply supplying power over an uninterruptible bus to an a.c. load, said a.c. load being connectable to an a.c. power supply network by means of an inductive arrangement having a variable effective impedance and a switch in series with said inductive arrangement, the procedure comprising the steps of:

varying the effective impedance to a low value, closing said switch, and maintaining an energy storage unit at a fully charged level by a static converter arrangement connected to said storage unit, when said network status is changed to normal, and

varying the effective impedance to a high value, opening said switch, and supplying power to said a.c. load from said storage unit by means of said static converter arrangement when said network status is changed to malfunctioning.

4,692,633

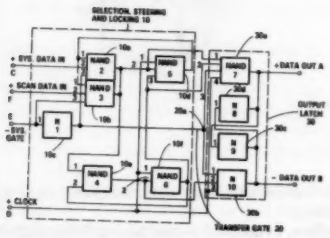
EDGE SENSITIVE SINGLE CLOCK LATCH APPARATUS WITH A SKEW COMPENSATED SCAN FUNCTION

Chuck H. Ngai, Endwell, and Gerald J. Watkins, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1984, Ser. No. 627,268

Int. Cl.[4] H03K *19/00, 19/02, 5/13*

U.S. Cl. 307—269 **5 Claims**



1. A latch circuit including a system data input line, a scan data input line, and a system gate input line, each of the input lines conducting a signal having a binary state, comprising:

selection means responding to the binary state of the signal on the system data input line, the scan data input line, and the system gate input line for selecting either said system data input line or said scan data input line in response to the binary state of the signal on said system gate input line and developing an output signal having the binary state of the selected data input line;

clock pulse conducting input means for conducting clock pulses, each of the clock pulses having a binary state;

circuit means connected to an output of said selection means and responding to the binary state of said output signal from said selection means and to the binary state of a clock pulse conducted via said clock pulse conducting input means for storing the binary state of said output signal from said selection means in response to said binary state of said clock pulse, said circuit means developing an output signal in response to the storage of said binary state of said output signal from said selection means,

said selection means receiving said output signal from said circuit means and, in response thereto, forcedly maintaining the development of said output signal from said selection means thereby locking the storage of said binary state of said output signal from said selection means in said circuit means; and

output latch means connected to the output of said selection means and responding to said output signal from said selection means, to the binary state of said clock pulse and to the binary state of the signal on said system gate input line for storing said output signal from said selection means therein when the signal on said system gate input line has a predetermined binary state during the development of said clock pulse, said output latch means developing a data out signal, representing an output signal from said latch circuit, in response to the storage of said output signal from said selection means therein.

4,692,634

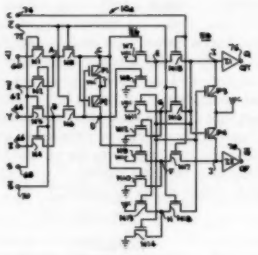
SELECTABLE MULTI-INPUT CMOS DATA REGISTER

Sheng Fang, Milpitas, and Sam H. Lee, Campbell, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 28, 1986, Ser. No. 856,920

Int. Cl.[4] H03K *3/356;* **G11C** *11/40*

U.S. Cl. 307—272.1 **9 Claims**



1. A CMOS data register comprising:

a master stage having first transfer gating means and first storage means;

said first transfer gating means being formed of first and second MOS transistors, said first transistor having its drain connected to a first node for receiving a data input signal, its source connected to a second node and its gate connected to a first clock input terminal for receiving a clock signal, said second transistor having its drain connected to a third node for receiving a signal complementary to the data input signal, its source connected to a fourth node and its gate connected to the first clock input terminal;

said first storage means being formed of third, fourth, fifth and sixth MOS transistors, said third transistor having its drain connected to a supply potential, its source con-

nected to a fifth node and its gate connected to the second node, said fourth transistor having its drain connected to a ground potenial, its source connected to the fifth node and its gate connected to the fourth node, said fifth transistor having its drain connected to the supply potential, its source connected to a sixth node and its gate connected to the fourth node, said sixth transistor having its drain connected to the ground potential, its source connected to the sixth node and its gate connected to the second node;

a slave stage having second transfer gating means, second storage means, and third transfer gating means;

said second transfer gating means being formed of seventh and eighth MOS transistors, said seventh transistor having its drain connected to the fifth node, its source connected to a seventh node and its gate connected to a second clock input terminal for receiving a signal complementary to the clock signal, said eighth transistor having its drain connected to the sixth node, its source connected to an eighth node and its gate connected to the second clock input terminal;

said second storage means being formed of ninth, tenth, eleventh and twelfth MOS transistors, said ninth transistor having its drain connected to the supply potential, its source connected to a ninth node and its gate connected to the seventh node, said tenth transistor having its drain connected to the ground potential, its source connected to the ninth node and its gate connected to the eighth node, said eleventh transistor having it drain connected to the supply potential, its source connected to a tenth node and its gate connected to the eighth node, said twelfth transistor having its drain connected to the ground potential, its source connected to the tenth node and its gate connected to the seventh node; and

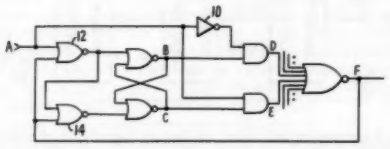
said third transfer gating means being formed of thirteenth and fourteenth MOS transistors, said thirteenth transistor having its drain connected to the ninth node, its source connected to the seventh node and its gate connected to the first clock input terminal, said fourteenth transistor having its drain connected to the tenth node, its source connected to the eighth node and its gate connected to the first clock input terminal.

4,692,635

SELF-TIMED LOGIC LEVEL TRANSITION DETECTOR

A. Karl Rapp, Los Gatos, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Jun. 26, 1986, Ser. No. 878,635
Int. Cl.[4] H03K *3/356*
U.S. Cl. 307—279 **7 Claims**



1. A self-timed transition detector for detecting a change in the logic level of an input signal, said detector comprising:

storage means for storing a signal indicative of the logic level of the input signal, coupled to receive the input signal;

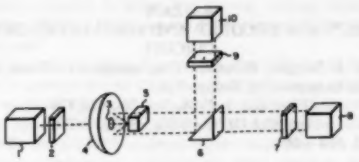
means responsive to a change in the logic level of the input signal to generate a change-indicator flag, said change-indicator flag being fed back to said storage means to update said stored signal to be indicative of said changed logic level of the input signal, said storage means being responsive to receipt of said change-indicator flag to generate an output which cancels the change-indicator flag when the stored signal is updated.

4,692,636

PYRILIUM DYE NONLINEAR OPTICAL ELEMENTS

Ying Wang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1985, Ser. No. 797,027
Int. Cl.[4] H03F *7/00*
U.S. Cl. 307—427 **18 Claims**



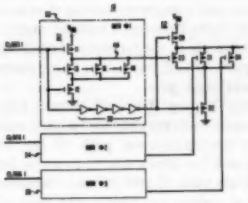
1. A nonlinear optical device comprising a nonlinear optical element and a source of coherent optical radiation, said nonlinear optical element comprising pyrilium dye and polymeric material having an alkylidene diarylene moiety in the recurring unit; and said element being in the form of a multiphase heterogeneous composition comprising a continuous phase of the polymeric material having therein a discontinuous phase comprising the pyrilium dye present in an aggregated ordered form.

4,692,637

CMOS LOGIC CIRCUIT WITH SINGLE CLOCK PULSE

Masakazu Shoji, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 8, 1985, Ser. No. 752,662
Int. Cl.[4] H03K *19/096, 19/003, 19/20, 17/284*
U.S. Cl. 307—443 **8 Claims**



1. A dynamic complementary MOS (CMOS) logic circuit comprising

first and second cascaded logic stages having, respectively, a first plurality and a second plurality of logic input terminals, a first and a second clock input terminal, and a first and a second output terminal.

said first stage having a logic array of field effect transistors of one channel conductivity type (N or P), said array being connected between the first logic input terminals and the first output terminal, said first output terminal being connected to one of the second plurality of logic input terminals,

means for applying a sequence of clock pulses to said first clock input terminal.

delay means, having an even number of cascade-connected CMOS inverter stages, responsive to the sequence of clock pulses for developing and applying delayed clock pulses to said second clock input terminal,

the first output terminal being precharged during the absence of a clock pulse, the first stage having a characteristic delay of a first type (pullup or pulldown) with respect to an initial edge of a clock pulse and to logic signals applied to its first input terminals,

and the delay means being arranged such that the sum of the

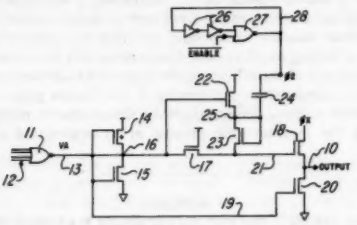
delays of said first type of all odd numbered inverter stages numbered from the first clock input is greater than, but less than two times, the first type delay of the first logic stage, and the sum of the delays of a second type (pulldown or pullup) of all even numbered inverter stages is small compared to the sum of the first type delays of the odd inverter stages.

4,692,638

CMOS/NMOS DECODER AND HIGH-LEVEL DRIVER CIRCUIT

Harvey J. Stiegler, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1984, Ser. No. 626,576
Int. Cl.[4] G11C *80/00*; H03K *19/094*
U.S. Cl. 307—449 **9 Claims**



1. A CMOS row decoder and row line driver circuit, comprising:

a logic gate having a plurality of address and address-complement inputs, and an output which is of one logic state for selection and the other logic state for non-selection,

a CMOS inverter with a P-channel transistor and an N-channel transistor, said transistors having source-to-drain paths connected in series between a voltage supply and ground, and an output node at the juncture of such source-to-drain paths, the gates of said transistors being connected to said output of said logic gate,

an output stage having first and second transistors, each having a source-to-drain path and a gate, and a first clock source, the source-to-drain path of the first transistor connecting said first clock source to a row line output, the source-to-drain path of said second transistor connecting said row line output to ground, the gate of said second transistor being connected to said output of said logic gate,

a voltage-boost circuit connected to the gate of said first transistor and including a series transistor having a source-to-drain path and a gate, the source-to-drain path of said series transistor being connected between a voltage supply and an intermediate node, and the gate of said series transistor being connected to said output node of said inverter, unidirectional conductive means connecting said intermediate node to said gate of said first transistor,

a second clock source connected to said intermediate node through a gated capacitor.

4,692,639

REGENERATIVE STROBE CIRCUIT FOR CMOS PROGRAMMABLE LOGIC ARRAY

Paul A. Jordan, Middlebury, Conn., assignor to General DataComm., Inc., Middlebury, Conn.

Filed Dec. 23, 1985, Ser. No. 812,176
Int. Cl.[4] G11C *80/00*; H03K *17/16, 19/096, 17/687*
U.S. Cl. 307—449 **17 Claims**

1. A regenerative strobe circuit for a CMOS logic gate comprising:

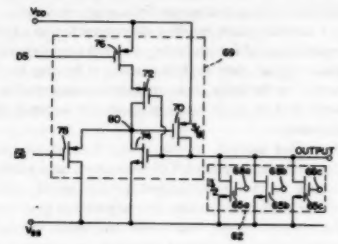
(a) an output node;

(b) a first transistor of a first channel type connected between said output node and a first potential level;

(c) a second transistor of said first channel type having a source connected to said first potential level, and a gate connected to a strobe signal;

(d) a third transistor connected between a gate of said first transistor and a second potential level, with a gate of said third transistor connected to a signal related to said strobe signal;

(e) a complementary transistor inverter connected between said second transistor and said second potential level, the complementary transistor inverter including a transistor



of said first channel type and a transistor of said second channel type having common gates connected to said output node and common drains connected to said gate of said first transistor, with a source of said first channel type transistor of said complementary transistor inverter connected to a drain of said second transistor, and a source of said second channel type transistor of said complementary transistor inverter connected to said second potential level, wherein

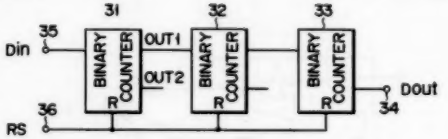
said logic gate comprises a plurality of transistors of a second channel type connected between said second potential level and said output node.

4,692,640

MAJORITY CIRCUIT COMPRISING BINARY COUNTER

Seigo Suzuki, Tokyo; Yukihiko Yabe, and Masumi Kawakami, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 20, 1985, Ser. No. 811,449
Claims priority, application Japan, Dec. 26, 1984, 59-273422
Int. Cl.[4] H03K *23/48*
U.S. Cl. 307—464 **7 Claims**



1. A circuit for indicating the binary logic level of a majority of bits in a serial data input of n bits, in which n is an odd integer not less than 3, comprising:

a serial data input terminal for receiving the serial data input of n bits;

a majority output terminal for providing a majority output signal for indicating the binary logic level of the majority of bits in the serial data input, in which the majority is an integer equal to $(n+1)/2$; and

a k-bit counter circuit for counting the number of bits in the serial data input that are at one binary logic level, in which k is the smallest integer such that 2^k is not less than $(n+1)$, and for generating the majority output signal at times when at least $(n+1)/2$ bits at the said logic level have been counted,

in which the counter circuit comprises a plurality of serially connected counter stages, including a first counter stage and a last counter stage, and the total number of counter stages is equal to k, with each counter stage having a corresponding stage input terminal and stage output terminal for providing a stage output corresponding to one of the k bits of the counter circuit, wherein

the stage input terminal of said first counter stage is coupled to the serial data input terminal,

the stage output terminal of said last counter stage is coupled to the majority output terminal, and

the counter stage output terminal of each counter stage other than the last is coupled to the stage input terminal of the next counter stage in series.

4,692,641

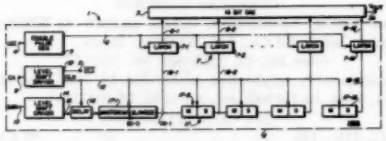
LEVEL SHIFTING CIRCUITRY FOR SERIAL-TO-PARALLEL CONVERTER

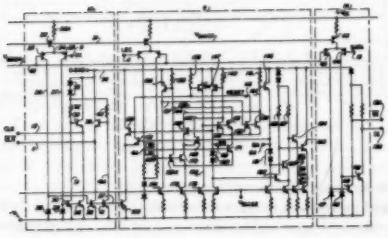
Frederick J. Highton, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Feb. 13, 1986, Ser. No. 829,707

Int. Cl.[4] H03K *19/003, 19/086, 19/092, 21/14*

U.S. Cl. 307—475 **23 Claims**





1. An integrated level shifting circuit for converting a first signal having TTL logic levels to corresponding complementary second and third signals having ECL logic levels, the TTL logic level signals being between a ground voltage on a ground voltage conductor and a positive first supply voltage on a first supply voltage conductor, the ECL logic levels being between the ground voltage and a negative second supply voltage on a second supply voltage conductor, the integrated level shifting circuit comprising in combination:

(a) means for providing a constant current;

(b) a first lateral PNP transistor having an emitter coupled to the constant current producing means and a base coupled to a first voltage reference conductor, the constant current producing means also being coupled to the first supply voltage conductor;

(c) a second lateral PNP transistor having an emitter coupled to the emitter of the first lateral PNP transistor and a base coupled to receive the first signal;

(d) a first diode having an anode coupled to a collector of the first lateral PNP transistor and a cathode coupled to the second supply voltage conductor, and a second diode having an anode coupled to the collector of the second lateral PNP transistor and a cathode coupled to the second supply voltage conductor;

(e) a first NPN current mirror transistor having an emitter coupled to the second supply voltage conductor and a base coupled to the anode of the first diode, and a second NPN current mirror transistor having an emitter coupled to the second supply voltage conductor and a base coupled to the anode of the second diode;

(f) first pull-up load circuit means coupled between the ground voltage conductor and a collector of the first NPN current mirror transistor, and second pull-up load circuit means coupled between the ground voltage conductor and a collector of the second NPN current mirror transistor; and

(g) first coupling means for coupling the collector of the first NPN current mirror transistor to a first output conductor to produce the second signal on the first output conductor, and second coupling means for coupling the collector of the second NPN current mirror transistor to a second output conductor to produce the third signal on the second output conductor.

4,692,642

ACTIVE PULL-UP CIRCUIT CONTROLLED BY A SINGLE PULL-UP CLOCK SIGNAL

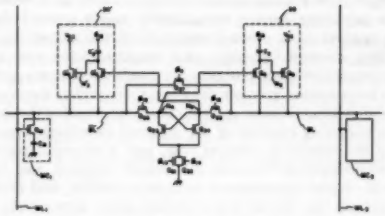
Yukio Fukuzo, and Yasukazu Inoue, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jul. 10, 1985, Ser. No. 753,715

Claims priority, application Japan, Jul. 10, 1984, 59-143004

Int. Cl.[4] H03K *3/356*

U.S. Cl. 307—530 **6 Claims**



1. A field effect transistor circuit comprising first and second data nodes, means for setting said first and second data nodes at an intermediate level at a first timing, data means for applying a voltage difference between said first and second data nodes at a second timing which is subsequent to said first timing, and an active pull-up circuit which is operable only in response to a single control signal generated at a third timing which subsequent to said second timing, said active pull-up circuit being composed of only a first field effect transistor of an enhancement type having a source-drain path coupled between a power voltage terminal and said second data node, a second field effect transistor of a depletion type having a source-drain path coupled between said second data node and a gate of said first transistor and a gate connected to said first data node, and a capacitor having a first end connected to the gate of said first transistor and a second end for receiving said control signal, said intermediate level being set at approximately half the voltage at said power voltage terminal, said second transistor meeting the condition of $0 > VTD > -\frac{1}{4} Vcc$, wherein Vcc represents the voltage at said power voltage and VTD represents the threshold voltage of said second transistor.

4,692,643

SEMICONDUCTOR SWITCHING DEVICE HAVING PLURAL MOSFET'S, GTO'S OR THE LIKE CONNECTED IN SERIES

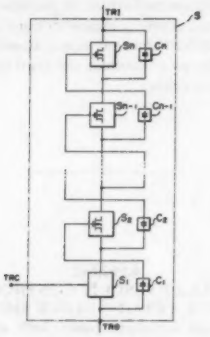
Norikazu Tokunaga; Hiroshi Fukui; Kouzou Watanabe; Hisao Amano, and Masayoshi Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,132

Claims priority, application Japan, Oct. 28, 1983, 58-200892; Nov. 2, 1983, 58-204696; Feb. 17, 1984, 59-27106; Feb. 22, 1984, 59-30243; Apr. 25, 1984, 59-81834; May 23, 1984, 59-102582

Int. Cl.[4] H03K *17/687, 17/60*

U.S. Cl. 307—584 **26 Claims**



1. A semiconductor switching device including a row of a plurality of switching elements (S_1–S_n) connected in series between an input and an output terminal of said semiconductor switching device, an input terminal of the input-nearest switching element S_n and an output terminal of the output-nearest switching element S_1 among said row being connected with said input terminal and said output terminal of said semiconductor switching device, respectively, and a control signal being applied to a control terminal of the output-nearest switching element, wherein said semiconductor switching device comprises a first plurality of capacitive elements each of which is connected between the output terminal of the output-nearer switching element and the control terminal of the input-nearer switching element of the adjacent switching elements among the switching element row, and a second capacitive element connected between the output terminal and input terminal of said input-nearest switching element, said switching elements (S_2–S_n) having insulating gates, respectively,

wherein a constant voltage element is connected between a control terminal and one of the inpt and output terminals of at least each of said switching elements other than the output-nearest one, each said constant voltage element being arranged so that it will be in series with said first and second capacitive elements when said switching elements are turned-off.

4,692,644

FLUID COOLED ACYCLIC GENERATOR ROTOR HAVING A COPPER CONDUCTOR DIFFUSION BONDED TO A MAGNETIC STEEL CORE

Henry G. Lenz, Scotia; Leonard Coffman, Schenectady, and Adrian M. Beltran, Ballston Spa, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 812,033, Dec. 23, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 923,358

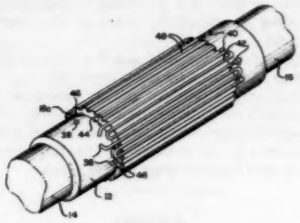
Int. Cl.[4] H02K *9/197*

U.S. Cl. 310—178 **6 Claims**

1. A rotor for an acyclic electromagnetic machine, said rotor comprising, in combination:

A. a core formed of ferromagnetic steel, said core having a peripheral surface and a plurality of internal passages opening into said peripheral surface for accommodating the circulation of a coolant;

B. a current conductor diffusion bonded to said core peripheral surface; and



C. a plurality of coolant tubes totally embedded in said conductor and affixed in coolant flow communication with said passages.

4,692,645

ROTATING ELECTRIC MOTOR WITH REDUCED COGGING TORQUE

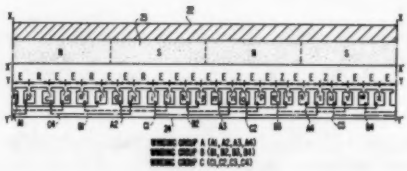
Makoto Gotou, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 11, 1985, Ser. No. 753,964

Claims priority, application Japan, Jul. 11, 1984, 59-144902; Jul. 11, 1984, 59-144903; Jul. 31, 1984, 59-161710

Int. Cl.[4] H02K *3/00*

U.S. Cl. 310—184 **58 Claims**



1. A rotating electric motor comprising:

a field permanent magnet member having permanently magnetized N and S poles alternately positioned in a substantially circular form around a rotary shaft of said rotating electric motor, said member having P poles, wherein P is an even number which is at least equal to 4; and

an armature core of a magnetic material having a plurality of teeth disposed between respective adjacent winding slots of a plurality of winding slots wherein a plurality of overlapping winding coils of polyphase winding groups are wound, said teeth being opposed to said poles of said magnet member, said core having T teeth, wherein T is an integral multiple of P and at least equal to 2P, and wherein said motor has H polyphase winding groups, wherein H is at least equal to 2;

wherein said teeth of said armature core are composed of standard-teeth each having an effective pitch $D=(360/T)$ degrees, and short-teeth each having an effective pitch smaller than D, and long-teeth each having an effective pitch larger than D, where the effective pitch of a tooth is defined by an angle between centers of entrance parts of two adjacent winding slots forming the tooth; and

wherein said teeth of said armature core form, alternately around said rotary shaft, at least a short-block having only short-teeth and standard-teeth including at least two of said short-teeth and at least one of said standard-teeth, and a long-block having only long-teeth and standard-teeth

including at least two of said long-teeth and at least one of said standard-teeth.

4,692,646

ROTATING ELECTRIC MOTOR WITH REDUCED COGGING TORQUE

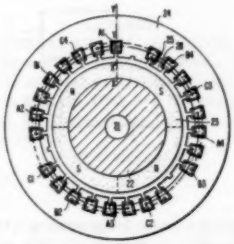
Makoto Gotou, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 30, 1985, Ser. No. 760,509

Claims priority, application Japan, Aug. 1, 1984, 59-161866; Aug. 1, 1984, 59-161867

Int. Cl.[4] H02K *3/00*

U.S. Cl. 310—184 30 Claims



1. A rotating electric motor comprising:

a field permanent magnet member substantially of a circular form having permanently magnetized N and S poles alternately positioned around a rotary shaft of said rotary electric motor, said magnet member having a number of poles P which is an even number at least equal to 4; and

an armature core of a magnetic material having a plurality of teeth each disposed between an adjacent pair of a plurality of winding slots where a plurality of overlapping winding coils of polyphase winding groups are wound, said teeth being opposed to the poles of said magnet member, said core having a number of said teeth T which is an integral multiple of P and at least equal to 2P, and said polyphase winding groups having a number of phases H which is at least equal to 2;

wherein said teeth are composed of short-teeth each having an effective pitch smaller than $D=360/T$ and long-teeth each having an effective pitch larger than D, wherein the effective pitch of a tooth is defined by an angle between centers of entrance parts of adjacent pairs of slots forming the tooth;

wherein said long-teeth are positioned at intervals of an equal angle, and said core has a number of said long-teeth which is less than or equal to T/2 and other than an integral multiple of P; and

wherein each of said long-teeth has a dummy-slot portion opposed to said magnet member and an effective pitch defined by an angle between centers of entrance parts of said dummy-slot and each of adjacent pairs of slots forming each of said long-teeth being equal to the effective pitch of each of said short-teeth.

4,692,647

ROTOR CONSTRUCTION IN AN INDUCTION MOTOR FOR ELIMINATING ROTOR REACTION

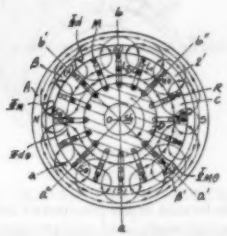
Sang S. Oh, 205 Han Yang Apt. 7 Dong, Sihung Dong, Kuro Ku, Seoul, Rep. of Korea, and Jang K. Oh, 132 E. Cardinal St., North Park, Wheeling, W. Va. 26003

Continuation-in-part of Ser. No. 162,571, Jun. 24, 1980, which is a continuation of Ser. No. 874,664, Feb. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 321,544, Jan. 5, 1973, abandoned. This application Apr. 12, 1982, Ser. No. 367,680

Claims priority, application Rep. of Korea, Apr. 14, 1981, 1981/1273

Int. Cl.[4] H02K *17/18*

U.S. Cl. 310—212 9 Claims



1. An induction motor comprising a stator having North and South poles, a rotor within said stator to form an air gap therewith, said rotor being rotatable relative to the stator, said rotor including a rotor core of magnetic material, a main winding on said rotor core effecting a magnetic interaction between said rotor and stator, a second winding at right angles to said first winding, said second winding including first and second independent sets of respective, isolated coils of closed loop configuration, said first and second sets of coils producing flux due to transformer induced m.m.f. in the coils, said rotor further including a non-magnetic means fixed within said rotor core and extending the axial extent thereof for opposing passage of flux produced in said first and second sets of coils to cause said flux to pass to said air gap and oppose rotor reaction flux in said air gap, said rotor and stator being concentric cylinders, the outer of which is said stator and the inner of which is said rotor, said main winding being wound on the periphery of said rotor, said first and second sets of coils being wound in radial planes on said rotor.

4,692,648

ROTATING COLLECTOR ASSEMBLY FOR ELECTRICAL MACHINES

Karl-Heinz Knoerzer, Im Kleegärtle 7a, 7818 Vogtsburg/Achkarren, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 863,734

Int. Cl.[4] H02K *13/00;* H01R *39/16*

U.S. Cl. 310—233 5 Claims

1. A collector for electrical machines, comprising:

(a) a carrier bushing having an outer mantle on which are provided, extending in the circumferential direction,

(i) first, swallowtail-type attachment devices in the form of crosspieces with first and second sides,

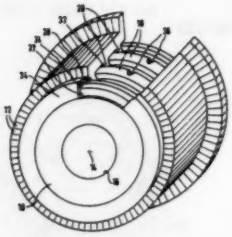
wherein each of at least two of the crosspieces has formed therein a slit of a particular width, and

(ii) ring grooves formed adjacent the crosspieces;

(b) a plurality of collector segments, each of which has a particular width and which can be attached to the carrier bushing by means of second, complementary, swallowtail-type attachment devices formed thereon in an intermeshing swallowtail arrangement, when the collector segments (12) are oriented axially, in which a neck of a swallowtail-type opening is so narrow that a corresponding swallow-

tail-type head which is fitted into each neck does not fit through the neck; and

(c) an intermediate space remaining between the carrier bushing and the collector segments, which can be filled with a casting material,



wherein the slits formed in the crosspieces enable the insertion of the second swallowtail type attachment devices of each collector segment, when the collector segment is oriented at an angle to the axial direction, so that the intermeshing swallowtail arrangement can be achieved when each collector segment is oriented in the axial direction.

4,692,649

DRIVING CIRCUIT OF A VIBRATION WAVE MOTOR

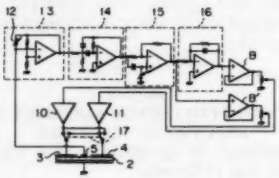
Kazuhiro Izukawa, Yokohama, and Kho Ishizuka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,653

Claims priority, application Japan, Mar. 1, 1985, 60-41403; Mar. 26, 1985, 60-62836; Mar. 26, 1985, 60-62837

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—316 **11 Claims**



1. A driving circuit for a vibration wave driving body in which a travelling vibration wave is generated in a vibration member having at least a pair of electro-mechanical energy converting element groups arranged or polarized in the fashion of a phase difference by applying a periodic signal to said electro-mechanical energy converting elements while endowing the periodic signal with a phase difference and said vibration member and a contact member contacing it are moved relative to each other by said travelling vibration wave, said driving circuit comprising:

(a) detecting means for detecting a vibration corresponding to the vibration wave of said vibration member, said detecting means being disposed at a position on said vibratory member except for said electromechanical converting elements to which said periodic signal is applied;

(b) an oscillator putting out said periodic signal at a frequency corresponding to an output signal put out from said detecting means;

(c) phase shifting means for shifting the phase of the output signal put out from said detecting means by a predetermined amount so as to be a phase which is in a predetermined relation to the phase of said periodic signal put out from said oscillator; and

(d) application means for applying said periodic signal to said electro-mechanical energy converting element groups while endowing said periodic signal with a phase difference.

4,692,650

VIBRATION WAVE MOTOR

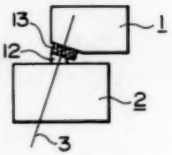
Ichiro Okumura, Yokohama; Takayuki Tsukimoto, Fujisawa; Takuo Okuno; Kazuhiro Izukawa, both of Yokohama; Hiroyuki Seki, Sagamihara; Hitoshi Mukohjima, Yokohama; Naoya Kaneda, Yokohama, and Akira Hiramatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,624

Claims priority, application Japan, Mar. 29, 1985, 60-065457

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **10 Claims**



1. A vibration wave motor for generating a travelling wave in a vibration member to drive a movable member by said travelling wave comprising:

an elastic projection projecting from said moveable member, an edge of said projection contacting said vibration member, said projection being elestically deformed by the vibration of said vibration member under the condition that a supporting point of said projection becomes a fixed point, and said projection contacting said vibration member such that a direction of locus of the elastic deformation of said projection is essentially coincident with a direction of locus of vibration in an area of said movable member in contact with said vibration member.

4,692,651

VIBRATION WAVE MOTOR

Akira Hiramatsu; Hitoshi Mukohjima; Naoya Kaneda; Takuo Okuno, all of Yokohama; Hiroyuki Seki, Sagamihara; Takayuki Tsukimoto, Fujisawa; Kazuhiro Izukawa, and Ichiro Okumura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,330

Claims priority, application Japan, Mar. 29, 1985, 60-65456

Int. Cl.[4] H01L *41/08*

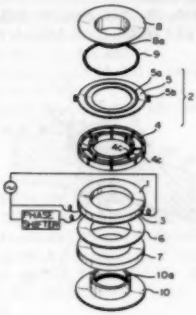
U.S. Cl. 310—323 **6 Claims**

1. A vibration wave motor comprising:

(a) vibration means having electro-mechanical conversion elements for generating a travelling vibration wave when electrical signals having a phase difference therebetween are applied to said elements; and

(b) movable means adopted to be frictionally driven by the travelling vibration wave generated in said vibration means, a press-contact portion of said movable means which is in contact with said vibration means being divided into a plurality of sections along a direction of

movement of said movable means and the rigidity of the surface of said divided press-contact portion, which is parallel with a forward moving direction of the travelling



vibration wave, being lower than that of the surface of said divided press-contact portion, which is perpendicular to the forward moving direction of the travelling vibration wave.

4,692,652

VIBRATION WAVE MOTOR

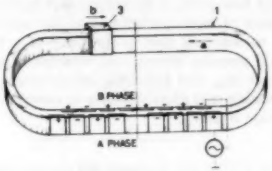
Hiroyuki Seki, Sagamihara, and Takuo Okuno, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,551

Claims priority, application Japan, Mar. 29, 1985, 60-066092; Jul. 12, 1985, 60-153750

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **6 Claims**



1. A vibration wave motor comprising:

(a) elliptical shaped vibration means; and

(b) electro-mechanical energy conversion means recessed into said elliptical shaped vibration means so as to make uniform the rigidity of said vibration means, the electro-mechanical energy conversion means being symmetrically arranged with respect to a minor axis of said vibration means.

4,692,653

ACOUSTIC TRANSDUCERS UTILIZING ZNO THIN FILM

Keiko Kushida, Kunitachi; Hiroshi Takeuchi, Matsudo, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

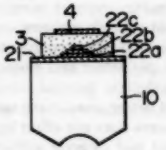
Filed Mar. 18, 1985, Ser. No. 712,852

Claims priority, application Japan, Mar. 23, 1984, 59-55756; Jul. 6, 1984, 59-139004; Jul. 9, 1984, 59-141745

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **8 Claims**

2. In an acoustic transducer comprising a first electrode comprised of a chromium film formed on a substrate and a gold film superposed thereon, a zinc oxide thin film formed by high frequency sputtering on said first electrode and at least one second electrode formed on said zinc oxide thin film, the improvement wherein the thickness of said chromium film is smaller than 30 nm, wherein the thickness of said gold film varies positionally so that the piezoelectric activity of said zinc oxide



thin film varies positionally depending on the thickness of said gold film.

4,692,654

ULTRASONIC TRANSDUCER OF MONOLITHIC ARRAY TYPE

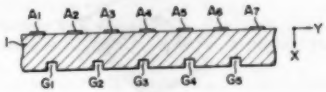
Shinichiro Umemura, Hachioji; Hiroshi Takeuchi, Matsudo, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,323

Claims priority, application Japan, Nov. 2, 1984, 59-230224

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **18 Claims**



1. An ultrasonic transducer cmprising:

a piezoelectric plate having a first face which is flat and having a second face opposite to said first face which is provided with a plurality of grooves; and

electrodes formed in array by splitting said first face of said piezoelectric plate into a plurality of areas so that each area of said piezoelectric plate may operate as an independent transducer element, said first face having said electrodes of array form disposed thereon being used for transmitting and receiving the ultrasonic wave.

4,692,655

PLASMA DISPLAY HAVING HEATER AND METHOD OF MAKING SAME

Herman R. Person; Dennis L. Raesner, and Gayle L. Meints, all of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed Nov. 14, 1985, Ser. No. 797,921

Int. Cl.[4] H01J *17/49, 7/24*

U.S. Cl. 313—15 **7 Claims**

1. A gas discharge display device comprising:

a lower substrate and an upper glass substrate;

sealing means joining said upper and lower substrates together in spaced apart relation to form a sealed envelope therebetween;

an ionizable gas filling said envelope;

at least one anode on said upper substrate and within said envelope;

at least one cathode segment positioned on said lower substrate and within said envelope;

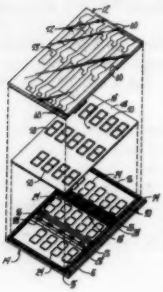
heater means separate from said cathode segment on said lower substrate, said heater means being positioned adjacent said cathode segment and within said envelope;

a layer of dielectric material overlying both said heater means and said cathode segment, and having at least one cathode opening therein exposing said cathode segment to said ionizable gas within said envelope;

said layer of dielectric material covering and electrically insulating said heater means from said ionizable gas so that said heater means does not affect light discharge between said anode and said cathode segment, said heater means being capable of radiating heat through said dielectric layer to maintain said ionizable gas at a predetermined minimum temperature when the external ambient temperature is below said predetermined minimum temperature.

7. A gas discharge display device made according to the method comprising:

placing a plurality of cathode elements on the upper surface of a lower substrate in a predetermined pattern;



placing a heater element on said upper surface of said lower substrate in a position adjacent and horizontally displaced from said cathode elements, said heater element being electrically separate from said cathode elements;

placing a layer of dielectric material over both said cathode elements and said heater element, said dielectric material having cathode openings therein for exposing said cathode elements upwardly through said layer of dielectric material, said dielectric material completely covering said heater element;

sealing an upper substrate in upwardly spaced relation to said upper surface of said lower substrate so as to form a sealed envelope between said upper and lower substrates, said upper substrate having at least one anode element thereon positioned within said envelope;

filling said envelope with an ionizable gas so that said cathode elements are exposed through said cathode openings in said dielectric material and said heater element is not exposed to said gas;

actuating said heater element to cause heat to radiate through said dielectric material to maintain said gas within said envelope at a predetermined minimum temperature.

4,692,656

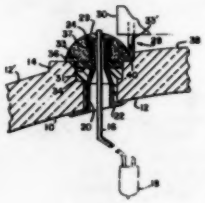
MOTOR VEHICLE HEADLIGHT WITH SELF-CENTERING LUG ASSEMBLY

John C. Poyner, Seymour, Ind., assignor to GTE Products Corporation, Danvers, Mass.

Filed Feb. 28, 1986, Ser. No. 835,023

Int. Cl.[4] H01K *1/18, 1/40, 1/44*

U.S. Cl. 313—113 **4 Claims**



1. In a motor vehicle headlight including an electric lamp, a glass reflector defining at least one opening therein and having a first reflective surface for reflecting light from said electric lamp and a second external surface including a boss portion extending above said second surface and surrounding said opening, a metal eyelet positioned substantially within said opening and including an outer portion projecting above said boss portion, a quantity of adhesive located within said opening and surrounding said eyelet, an external contact lug having an upstanding leg portion and a base portion, said base portion having an aperture therein, said outer portion of said eyelet attached to said base portion of said contact lug, and a lead-in support wire extending within said aperture within said base portion of said contact lug for being electrically connected to said electric lamp, the improvement comprising means formed within said base portion of said contact lug for centering said base portion of said contact lug within said opening in said reflector to maintain said contact lug in a fixed orientation within said opening during said attachment of said eyelet to said contact lug, said centering means extending within said opening within said glass reflector in contact with the interior walls of said opening.

4,692,657

SPARK PLUG FOR AN OTTO-TYPE INTERNAL COMBUSTION ENGINE

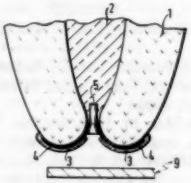
Werner Grünwald, Gerlingen, and Kurt Schmid, Ditzingen-Schöckingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 28, 1986, Ser. No. 808,333

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446128

Int. Cl.[4] H01T *13/20*

U.S. Cl. 313—130 **8 Claims**



1. A spark plug for an ignition system of an internal combustion engine having

a rotation-symmetrical ceramic hollow support body (1, 11) of insulating, heat-resistant material;

a center electrode located at an end portion of said body;

and an electrically conductive material (**2, 5; 12, 13**) located within said hollow support body to establish an electrical connection with the ignition system, and electrically connected to the center electrode,

wherein the center electrode comprises

an electrode layer of platinum or a mixture of platinum and a ceramic material and of a thickness of between 5 to 15 micrometers applied to an end face of the end portion of said support body (**1, 11**) and

a ceramic protective layer (**4, 15**) is provided, covering the electrode layer (**3, 14**),

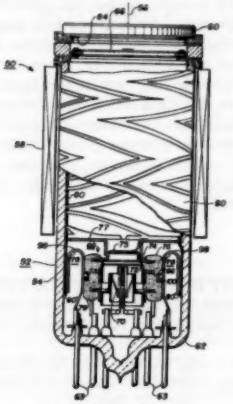
said ceramic protective layer (**4, 15**) having a thickness of between 5 to 10 micrometers.

4,692,658

IMAGING SYSTEM HAVING AN IMPROVED SUPPORT BEAD AND CONNECTOR

Louis D. Miller, Leola, and Donald B. Kaiser, Lancaster, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 28, 1986, Ser. No. 856,279
Int. Cl.[4] H01J *29/02, 29/82, 31/26*
U.S. Cl. 313—365 **5 Claims**



1. In an imaging system for focusing and deflecting an electron beam comprising:

an evacuated envelope structure having a longitudinal axis;

magnetic field means for generating a substantially uniform magnetic field along said axis within said envelope;

electric field means for generating a variable substantially uniform electric field within said envelope to deflect said electron beam along two coordinates of said system, said electric field being orthogonal to said magnetic field;

an electron gun disposed within said envelope for generating and directing said electron beam through said magnetic and electric fields, said electron gun including a cathode, a first grid electrode and a second grid electrode secured in spaced-apart relation by a plurality of support beads located-substantially symmetrically around said electron gun; and

a target located within said envelope opposite said electron gun, said target being disposed in a plane perpendicular to said longitudinal axis, the improvement wherein

each of said support beads of said electron gun comprising a body of insulating material having a first major surface and an oppositely disposed second major surface, said first major surface having a recess formed therein which extends into said body of the insulating material to a depth less than the thickness of the bead, and

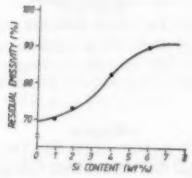
a plurality of connectors corresponding in number to said plurality of support beads, each of said connectors comprising a single integral conductive member having a proximal end, a distal end and a central body interconnecting said proximal and distal ends, said proximal end of each of said connectors being attached to a portion of said envelope structure, said distal end of each of said connectors being in contact with said electric field means, said central body including a flat support portion adjacent to said proximal end and a reverse-bend portion disposed between said flat support portion and said distal end, said flat support portion of each of said connectors having a protrusion extending therefrom, the protrusions projecting into the recesses formed in said support beads to secure said electron gun, said reverse-bend portion of each of said connectors providing biasing means to radially position said electron gun on said longitudinal axis.

4,692,659

COLOR CATHODE RAY TUBE HAVING SHADOW MASK WITH SILICON

Shigeo Takenaka; Norio Koike; Takeo Itou, and Hidemi Matsuda, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1986, Ser. No. 843,247
Claims priority, application Japan, Mar. 27, 1985, 60-60908
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—402 **4 Claims**



1. A color cathode ray tube comprising:

a panel formed with a phosphor screen on its inside face;

a neck having an electron gun assembly facing said phosphor screen;

a funnel joining said neck to said panel constituting an envelope;

a shadow mask assembly comprising a shadow mask arranged close to and facing the electron gun side of said phosphor screen and a mask frame supporting said shadow mask;

and an inner shield extending on the electron gun side from said shadow mask assembly along the inner face of said funnel, wherein at least one surface of said shadow mask assembly and said inner shield is provided with a blackened region containing Al, Fe and Si, and the Si content in the vicinity of the surface of said blackened region is greater than 1.5 wt% and less than 30 wt%.

4,692,660

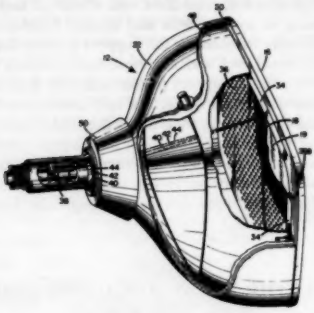
IMPROVED INDEXING MEANS WITH OPTIMIZED GROOVE ANGLE

Robert Adler, Northfield, and Paul Strauss, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 21, 1986, Ser. No. 831,697
Int. Cl.[4] H01J *29/86, 9/24*
U.S. Cl. 313—477 R **12 Claims**

3. Components of a color cathode ray tube including at least a faceplate, a frame, and a funnel with mutual sealing areas, said components having indexing means for use in the manufacture and assembly of the components, said indexing means comprising three V-grooves located in the sealing area of a first of said components, and three indexing protuberances in

the sealing area of a second of said components in apposition to said V-grooves for mating in registration with said V-grooves,



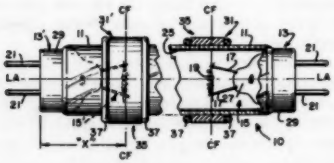
said indexing means being characterized by said grooves each having a subtended angle in the range of 34 to 75 degrees.

4,692,661

FLUORESCENT LAMP WITH STATIC MAGNETIC FIELD GENERATING MEANS

Philip E. Moskowitz, Peabody, and Jakob Maya, Brookline, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Feb. 18, 1986, Ser. No. 830,152
Int. Cl.[4] H01J *61/42, 1/50*
U.S. Cl. 313—485 **8 Claims**



1. In a fluorescent lamp including an elongated tubular envelope having first and second opposing end portions an including therein an atmosphere of mercury and a rare gas, and first and second electrodes disposed within said first and second opposing end portions, respectively, each of said electrodes including a pair of lead wires and a filament, the improvement comprising:

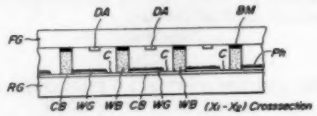
first and second magnetic field generating means substantially surrounding said first and second electrodes, respectively, each of said magnetic field generating means applying a static magnetic field across said respective electrode and in a substantially axial pattern along the longitudinal axis of said elongated tubular envelope such that the maximum field strength of said field is substantially located at said filament thereof, whereby the efficacy of said fluorescent lamp is increased.

4,692,662

HIGH CONTRAST DISPLAY DEVICE

Masatoshi Wada, Osaka, and Tetsuo Sakai, Tokyo, both of Japan, assignors to Okuno Chemical Industries Co. Ltd. and Nippon Hoso Kyokai, Japan

Filed Jul. 8, 1985, Ser. No. 752,542
Claims priority, application Japan, Jul. 13, 1984, 59-144112; Oct. 4, 1984, 59-206979
Int. Cl.[4] H01J *61/35*
U.S. Cl. 313—493 **19 Claims**



1. A display device including a plurality of light-emitting elements arranged in a matrix plane, each of said light-emitting elements comprising:

an envelope;

a light emitting member, within said envelope;

means for energizing said light-emitting member; and

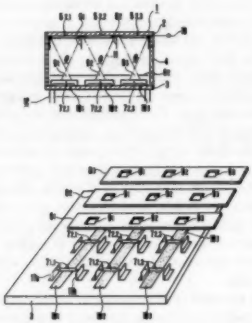
a light-reflecting white member of glassy material coated and fired on at least a portion of an inner wall of said envelope, for reflecting light emitted from said light-emitting member, said light-reflecting white member comprising fired glassy material including at least 20% by weight of a glass powder containing substantially no black pigment and 5 to 80% by weight of at least one transparent material having a refractive index other than that of said glass powder.

4,692,663

FLUORESCENT DISPLAY TUBE FOR LIGHT SOURCE

Masaaki Kobayashi; Yosiyuki Okubo, and Kazunori Tatsuda, all of Ise, Japan, assignors to Ise Electronics Corporation, Ise, Japan

Filed Jun. 30, 1986, Ser. No. 880,139
Claims priority, application Japan, Jul. 8, 1985, 60-148215
Int. Cl.[4] H01J *63/06*
U.S. Cl. 313—495 **4 Claims**



1. A fluorescent display tube comprising:

an envelope constituted by a front panel, a rear panel, and a side panel, at least said front panel being able to transmit light therethrough;

a plurality of phosphor screens formed on an inner surface of said front panel to constitute a matrix in a first direction and in a second direction perpendicular to the first direction;

a plurality of anodes, respectively arranged around said phosphor screens, for accelerating electron beams;

a plurality of cathodes, respectively corresponding to said phosphor screens and supported to float from an inner surface of said rear panel, for emitting the electron beams;

plate-like control grids which are respectively arranged between said phosphor screens and said cathodes arranged in the first direction, and which have apertures for transmitting the electron beams from said cathodes to said phosphor screens; and

stripe-like back electrodes which oppose said cathodes aligned on said inner surface of said rear panel along the second direction,

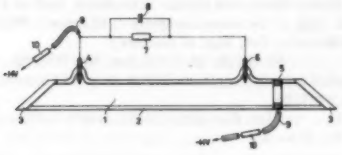
wherein voltages applied to said control and back electrodes are higher or lower than those applied to said cathodes, thereby controlling light emission of said phosphor screens.

4,692,664

GASEOUS DISCHARGE DEVICE

Gnian C. Lim, Los Angeles, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Filed Sep. 12, 1985, Ser. No. 775,336
Int. Cl.[4] H01J *7/44*
U.S. Cl. 315—60 **4 Claims**



1. A gaseous discharge device comprising:

a discharge tube enclosing lasing gas medium therein;

a pin-shaped main discharge anode whose sharp end projects inside said discharge tube and a cylindrical ring main discharge cathode mounted along the inner circumference of and inside said discharge tube; and

a pin-shaped auxiliary electrode, the sharp end of which projects inside said discharge tube, located in the immediate vicinity of said main discharge cathode, wherein said main discharge anode is electrically connected to a positive terminal of a high voltage power supply and said main discharge cathode is connected to a negative terminal of said power supply, and said auxiliary electrode is electrically connected to said main discharge anode through a resistor and a capacitor which are connected in parallel to each other, wherein the resistance value of the resistor is $R=V/BI$ and the capacitance value of the capacitor is $C=10tI/V$, in which V is an operating discharge voltage applied across the main anode and main cathode, I is an operating discharge current, t is a rise time of said voltage V from the power supply, and B is a value from 0.01 to 0.05.

4,692,665

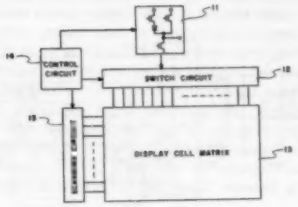
DRIVING METHOD FOR DRIVING PLASMA DISPLAY WITH IMPROVED POWER CONSUMPTION AND DRIVING DEVICE FOR PERFORMING THE SAME METHOD

Hiraku Sakuma, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 7, 1986, Ser. No. 882,174
Claims priority, application Japan, Jul. 5, 1985, 60-148615; May 15, 1986, 61-112173
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.4 **18 Claims**

1. A method of driving a plasma display device including a plurality of plasma display cells arranged in a form of matrix, said plasma display cells arranged in each line being connected to a line electrode and said plasma display cells arranged in each column being connected to a column electrode, said method comprising the steps of:

applying a scan pulse to said line electrodes, sequentially;



applying a signal having a predetermined voltage to selected ones of said column electrodes connected to said plasma display cell or cells to be illuminated; and

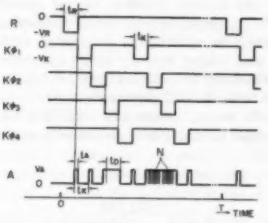
reducing said predetermined voltage of said signal to a value lower than said predetermined voltage after said cell or cells initiate illuminating.

4,692,666

GAS-DISCHARGE DISPLAY DEVICE

Yukio Okamoto, Sagamihara, and Shinichi Shinada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,298
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.4 **6 Claims**



1. A gas-discharge device comprising:

a plurality of cathodes disposed on a substrate to extend in one direction in a relation parallel to and equally spaced apart from each other, said cathodes being connected to respective cathode terminals by multiphase connection;

a plurality of barrier ribs disposed above said cathodes to extend in a direction crossing with the extending direction of said cathodes and in a relation parallel to and equally spaced apart from each other;

a plurality of anodes disposed in a relation parallel to and equally spaced apart from each other so as to be located between said barrier ribs, said anodes being connected to respective anode terminals;

a face plate disposed on said anodes, said face plate and said substrate defining therebetween a space which is filled with a gas and maintained gas-tight; and

means for applying time-serial multiphase pulse voltages to said respective cathode terminals and for applying a pulse voltage including pulses of small width occurring at a timing corresponding to that of said multiphase pulse voltages and pulses of large width representing display information superposed on said small width pulses to each of said anode terminals.

4,692,667

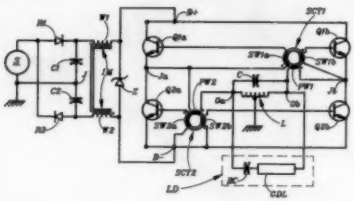
PARALLEL-RESONANT BRIDGE-INVERTER FLUORESCENT LAMP BALLAST

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Oct. 16, 1984, Ser. No. 661,468

Int. Cl.[4] H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **9 Claims**



1. Ballasting means for a gas discharge lamp, comprising:

a source of relatively low frequency AC voltage, said source having a first and a second AC source terminal, said first AC source terminal being connected with earth ground;

DC voltage supply powered from said source of AC voltage and operable to provide a DC voltage across a pair of DC terminals, said DC voltage supply having a symmetrical center-tap directly connected with said first AC source terminal;

bridge inverter connected with said pair of DC terminals and operable to provide a relatively high frequency AC voltage between a first inverter output terminal and a second inverter output terminal, there existing a first voltage between the center and tap of the first inverter output terminal and a second voltage between the center tap and the second inverter output terminal, the first voltage being approximately equal in absolute magnitude but opposite in polarity as compared with the second voltage, and bridge inverter being operable periodically and alternatively to connect each of the inverter output terminals with the DC terminals; and

output circuit means connected with said inverter output terminals and operable to connect with and to power said lamp.

4,692,668

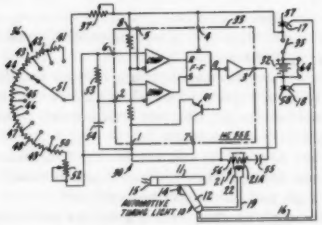
STROBE ADAPTOR FOR AUTOMOTIVE TIMING LIGHT

Francis J. Brown, Chicago, Ill., assignor to Deniston Company, Alsip, Ill.

Filed Jul. 25, 1983, Ser. No. 516,598

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—241 S **12 Claims**



1. A compact strobe adaptor for converting a hand-held automotive timing light into a portable, compact industrial troubleshooting stroboscope without modification of the timing light, the timing light being of the kind comprising a light source operable over a broad frequency range, a driver circuit for the light source, an external power cord for energizing the driver circuit that terminates in two terminal clamps connectable to the terminals of an automotive battery of predetermined voltage, and a pickup cord connected to the drive circuit that terminates in a clamp-type inductive pickup, the strobe adaptor comprising:

a housing;

a D.C. power source of said predetermined voltage, mounted in the housing;

an oscillator mounted in the housing and connected to the power source;

a frequency adjustment circuit, connected to the oscillator, for adjusting the operating frequency of the oscillator over a broad range;

a pair of power terminals mounted externally on the housing and connected to the power source, each power terminal having a configuration suitable for engagement by one of the timing light power cord terminal clamps;

and a load circuit, connected to the oscillator, including a load element mounted externally on the housing and having a configuration suitable for encompassing engagement by the inductive pickup clamp of the timing light.

4,692,669

PICTURE TUBE SCREEN GRID POTENTIAL CONTROL

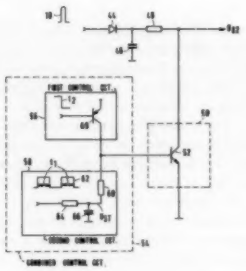
Karl-Heinz Black, and Günter Schuchardt, both of Hildesheim, Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,740

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407388

Int. Cl.[4] H01J *29/52;* **H04N** *5/68*

U.S. Cl. 315—381 **8 Claims**



1. Electrode voltage control circuit for the screen grid of a picture tube interposed between a rectifier diode and said screen grid, said diode being interposed in circuit between a source of high voltage pules and said screen grid, said control circuit comprising;

at least one resistance **(48, 74)** connected in series between said diode and said screen grid, said one resistance having a first terminal electrically nearer said diode and a second terminal electrically nearer said screen grid;

a transistor **(52)** having its controlled path connected between ground and said second terminal of said resistance, said transistor also having a control electrode, and

means connected to said control electrode of said transistor for maintaining the voltage normally applied to said screen grid at an adjustably pre-set value, for reducing the voltage applied to said screen grid to a low or zero value in response to a persistence of an excessive value of electron beam current in said picture tube and for allowing the voltage applied to said screen grid to rise to said pre-set value after said excessive value of electron beam current no longer persists, said means connected to said control electrode of said transistor including a first control branch

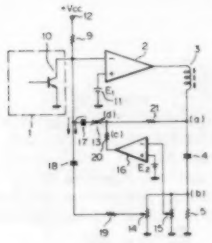
circuit (56) and a second control branch circuit (58) which have their outputs connected together and to said control electrode of said transistor.

4,692,670

VERTICAL DEFLECTION CIRCUIT

Norio Imaizumi, Gunma, Japan, assignor to Sanyo Electric Co., Osaka, Japan

Filed Nov. 4, 1985, Ser. No. 794,830
Claims priority, application Japan, Nov. 13, 1984, 59-239107
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—388 **6 Claims**



1. A vertical deflection circuit for providing saw-tooth wave deflection current in a vertical deflection coil for a CRT tube comprising:

a first amplifier with an input terminal coupled with an output of a vertical oscillation circuit;

a first resistor coupled between said input terminal of the first amplifier and a power source;

a first capacitor one end of which is coupled with said input terminal of the first amplifier;

an output of said first amplifier being coupled with one end of the deflection coil, the other end of said deflection coil is grounded through a second capacitor and a second resistor,

the other end of said first capacitor being coupled with a first junction point of said second capacitor and said second resistor, to provide a first feedback path; and

a second feedback path is provided so that a sum voltage of a parabolic voltage at a second junction point of said deflection coil and said second capacitor, and saw-tooth wave voltage at the first junction point of said second capacitor and said second resistor, is applied to said input terminal of the first amplifier, said second feedback path comprises a second amplifier with an input terminal coupled with the first junction point of said second capacitor and said second resistor, a resistor network for providing sum of voltages at the second junction point of the deflection coil and the second capacitor, and output of the second amplifier and a third capacitor are coupled between said resistor network and the input terminal of the first amplifier.

4,692,671

ELECTRICALLY-COMPENSATED CONSTANT SPEED DRIVE

Bryan W. Dishner, Roscoe, Ill.; Richard D. Juarros, Los Lunas, N. Mex., and P. John Dhyanchand, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 812,396, Dec. 23, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 893,946
Int. Cl.[4] F01D *15/10*; **H02P** *9/00*
U.S. Cl. 318—11 **24 Claims**

1. An electrically-compensated constant speed drive (CSD) for developing motive power at a constant speed from variable speed motive power developed at an output shaft of a prime mover, comprising:

a control permanent magnet machine (PMM) having electrical power windings and a motive power shaft;

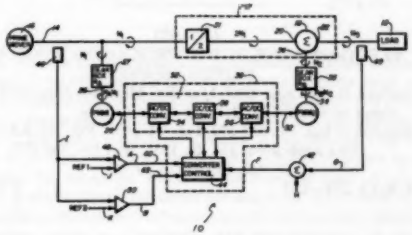
a speed-compensating permanent magnet machine (PMM) having electrical power windings coupled to the windings of the control PMM and a motive power shaft;

a differential speed summer having a first input coupled to the prime mover output shaft, a second input coupled to the motive power shaft of the speed-compensating PMM and an output at which the constant speed motive power is produced, the motive power shaft of the control PMM being coupled to the output of the speed summer; and

a power converter interconnecting the windings of the PMM's for managing the flow of electrical power therebetween whereby motive power is developed by the speed-compensating PMM in an amount sufficient to maintain the output of the speed summer at a desired speed.

5. An electrically-compensated constant speed drive (CSD) for developing motive power at a constant speed from variable speed motive power developed at an output shaft of a prime mover, comprising:

a control permanent magnet machine (PMM) having electrical power windings and a motive power shaft;



a speed-compensating permanent magnet machine (PMM) having electrical power windings coupled to the windings of the control PMM and a motive power shaft;

a differential speed summer having a first input coupled to the prime mover output shaft, a second input coupled to the motive power shaft of the speed-compensating PMM and an output at which the constant speed motive power is produced, the motive power shaft of the control PMM being coupled to the output of the speed summer;

a first bi-directional AC/DC converter coupled to the electrical power windings of the control PMM;

a second bi-directional AC/DC converter coupled to the electrical power windings of the speed-compensating PMM;

a bi-directional DC/DC converter coupled between the AC/DC converters; and

means for controlling the AC/DC converters and the DC/DC converter so that electrical power developed by one of the permanent magnet machines is delivered to the other of the permanent magnet machines whereby motive power is developed by the motive power shaft of the speed-compensating PMM in an amount sufficient to maintain the output of the speed summer at a desired speed.

4,692,672

VIBRATION WAVE MOTOR

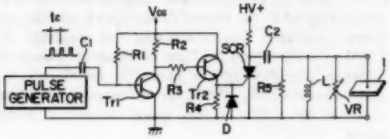
Takuo Okuno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1985, Ser. No. 695,719
Claims priority, application Japan, Feb. 10, 1984, 24024
Int. Cl.[4] H01L *41/08*
U.S. Cl. 318—116 **5 Claims**

1. A vibration wave motor comprising:

(a) a vibration member including first and second electrostrictive means;

(b) a control circuit for intermittently applying frequency signals of different phases, respectively, to said first and second electrostrictive means, thereby producing a travelling wave in said vibration member according to the application of the frequency signals to said first and second electrostrictive means;



(d) a movable member in operational relationship with said vibration member is driven by the travelling wave; and

(d) an adjusting means for adjusting a ratio of a first interval during which the frequency signal is applied to said electrostrictive means to a second interval during which the frequency signal is not applied to said electrostrictive means, thereby controlling motor drive speed.

4,692,673

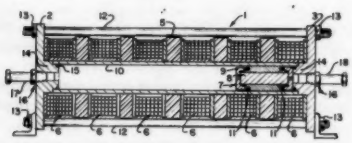
ELECTROMAGNETIC RECIPROCATING PUMP AND MOTOR MEANS

Sanford D. DeLong, 1367 Macklin, Ellisville, Mo. 63011, assignor to Sanford D. DeLong, Ellisville, Mo.

Division of Ser. No. 351,272, Feb. 22, 1982, Pat. No. 4,541,787. This application Jul. 29, 1985, Ser. No. 760,255

Int. Cl.[4] H02K *41/00*

U.S. Cl. 318—132 **7 Claims**



1. An electromagnetic reciprocating means for use for providing mechanical force for actuation of other means comprising a cylinder means, electromagnetic reciprocating means comprising a motor means, a closure means provided at each end of the said cylinder means, at least a pair of electromagnets operatively associated with said cylinder means, a magnetically responsive piston provided within said cylinder means and capable of longitudinally shifting reciprocally within said cylinder means upon the sequential energization of said electromagnets, an electrical circuitry means connecting with said electromagnets and upon energization charging said electromagnets in progressively timed sequence for inducing the reciprocal shifting of said piston within said cylinder means, said motor means comprising a linear reciprocating motor means, a drive shaft connecting with said piston, there being an aperture provided through a closure means at least at one end of said cylinder means, said drive shaft extending through the closure means aperture and furnishing linear moving force upon the reciprocating movement of said motor means piston, a seal formed between the reciprocating moving drive shaft and the closure means aperture, a spacer means provided between each of the adjacent electromagnets and the closure means, each electromagnet and the said spacer means provided substantially surrounding the internally arranged cylinder means, fastener means tightly securing the closure means, internally arranged cylinder means, spacer means, and electromagnets together, said reciprocating means as secured together being hermetically sealed, and seal provided between the internally arranged cylinder and the closure means to prevent leakage at their areas of contact.

4,692,674

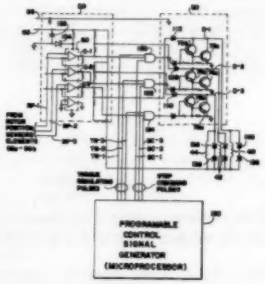
BRUSHLESS DC MOTOR CONTROL SYSTEM RESPONSIVE TO CONTROL SIGNALS GENERATED BY A COMPUTER OR THE LIKE

Douglas T. Packard, La Canada, and Donald E. Schmitt, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 26, 1985, Ser. No. 727,838

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—254 **27 Claims**



5. In a system for controlling a brushless DC motor of the type having a multiphase winding and a rotor mounted on a shaft, the combination which comprises:

(a) shaft position-sensing means for deriving shaft position signals indicative of the angular position of the motor shaft;

(b) commutation signal-generating means responsive to the shaft position signals for generating commutation signals representative of each commutation period for each phase winding;

(c) driving means individually associated with each phase winding for selectively applying current to the associated winding;

(d) control signal-generating means for generating independent control signals for each phase winding; and

(e) gating means individually connected to the driving means for each phase winding and responsive to the commutation and control signals for the respective phase winding for enabling the driving means associated with each phase winding to thereby apply current to the respective winding only upon the occurence of the commutation signal and control signal for said winding, whereby the motor shaft can be incrementally advanced to a selected position.

25. In a system for synchronizing the motion of a plurality of brushless DC motors wherein each motor includes a rotor and a multiphase wound stator with each phase winding being arranged to be energized in succession to provide a rotating magnetic field; a commutation signal generator responsive to the position of the rotor for generating commutation signals representative of (the) commutation time for each phase winding; a driving circuit individually associated with each phase winding for selectively applying current to the associated winding; and a gating circuit individually connected to the driving circuit for each phase winding and responsive to the commutation signals and to an input control signal for enabling the driving circuit associated with each phase winding upon the occurrence of the commutation signal and the input control signal, the combination which comprises:

(a) gating means individually responsive to the commutation

signals associated with each respective phase winding of each motor for producing an output signal when each commutation signal for an associated phase winding is completed; and

(b) input control signal-generating means for applying said input control signal to the driving circuit associated with the next succeeding phase winding to be energized in response to an output signal from the gating means.

4,692,675

CONTROL AND ENERGIZATION CIRCUIT FOR A BRUSHLESS D-C MOTOR

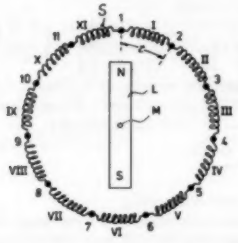
Gerhard Falk, Rossdorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,333

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528765

Int. Cl.[4] **H02K** *29/10*

U.S. Cl. 318—254 **12 Claims**



1. Control and energization circuit for a brushless d-c motor having

a stator (S) and a magnetic rotor (L);

a stator winding comprising a plurality of winding sections (I, II . . . XI), ring-connected and located on the stator, adjoining winding sections being coupled by a junction (1, 2 . . . 11) serially connecting said adjoining winding sections;

a rotor position sensing means (26) associated with respective junctions and determining of the rotor has a predetermined relative position with respect to any selected junction;

a source (15, 16) of d-c power; and

a control and supply network selectively connecting the terminals (15, 16) of the source to selected junctions in accordance with the position of the rotor,

said control and supply network comprising:

a plurality of network systems associated with the junctions (1, 2 . . . 11), each network system including

a first switch (21) controllably connecting a first terminal (15) of the source to the associated junction;

a second switch (20) controllably connecting a second terminal (16) of the source to the associated junction;

and a logic network (25, 23; 28, 29, 30, 24, 22) responsive to a signal from the rotor position sensing means and, selectively, controlling said first switch of the associated junction and a second switch of another junction, in accordance with a predetermined switching logic.

4,692,676

SEWING MACHINE DRIVING APPARATUS

Takashi Dohi, Hirakata; Nobuho Shibata, Katano, and Kenichi Ohara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

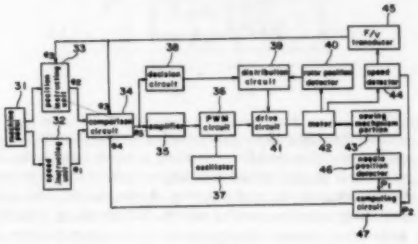
PCT No. PCT/JP85/00087, § 371 Date Nov. 4, 1985, § 102(e) Date Nov. 4, 1985, PCT Pub. No. WO85/03958, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 26, 1985, Ser. No. 798,279

Claims priority, application Japan, Mar. 2, 1984, 59-41149; Mar. 19, 1984, 59-52529

Int. Cl.[4] **H02P** *3/10*

U.S. Cl. 318—269 **6 Claims**



1. A machine driving apparatus comprising a driving motor composed of a brushless motor for driving a machine shaft, a rotor position detector for detecting the rotor position of said motor, a distribution circuit which switches the energization phase of the stator winding of a motor in accordance with a signal from said rotor position detector, a speed detector for detecting the rotational speed of the machine shaft or the motor, a needle position detector for detecting the position of the needle shaft, a speed instructing unit for generating a speed instruction signal in accordance with the operation of the machine pedal, a position instructing unit for generating a position instructing signal which becomes a stop instructing signal in accordance with the operation of said machine pedal, a comparison circuit which compares a speed instructing signal with a speed detecting signal or a position instructing signal with a position detecting signal to output a difference signal, a drive circuit which closes a current proportional to said difference signal to the stator winding selected by said distribution circuit to drive said motor, a decision circuit which decides the positive and negative of the difference signal to be outputted from said comparison circuit to switch the operational mode of said distribution circuit into a positive operational torque generating mode and a reverse operational torque generating mode, wherein said motor is damped in reverse operation by a position instructing signal in accordance with the operation of said machine pedal and a needle position detecting signal detected by said needle position detector to stop the machine needle in a given position.

4,692,677

WINDSHIELD WIPER SYSTEM

Kurt Bauer, Ingersheim, and Theodor Schneider, Freudental, both of Fed. Rep. of Germany, assignors to SWF Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Dec. 16, 1985, Ser. No. 809,934

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446761

Int. Cl.[4] **B60S** *1/08*

U.S. Cl. 318—443 **15 Claims**

1. A windshield wiper system, comprising:

an operating switch;

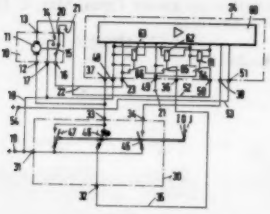
an electric motor having a shaft rotatable in a first direction and driving at least one wiper to and fro between two reversing positions within a wiping area when said operating switch is in at least a first position and rotatable in a

second direction to drive said wiper to a concealed park position outside said wiping area when said operating switch is switched to an off position;

a rotating drive member coupled to said shaft;

a switching member coupled to said rotating drive member;

a position switch for providing a signal for causing said motor to reverse directions from said first direction to said



second direction after said operating switch is switched to said off position and for providing a signal to switch said motor off at said parking position, said position switch being coupled to said rotating drive member by said switching member, said position switch being operable whereby it always changes over at the same position of said drive member and independently of the direction of rotation of said shaft.

4,692,678

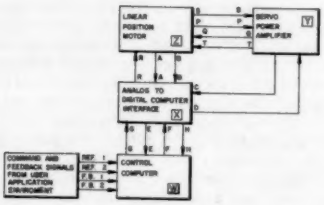
CLOSED LOOP SERVO CONTROL SYSTEM

Robert E. Lee, 68 Dean St., Westwood, N.J. 07675

Continuation-in-part of Ser. No. 680,137, Dec. 10, 1984, Pat. No. 4,616,153. This application Oct. 2, 1986, Ser. No. 916,993

Int. Cl.[4] H02K *41/00*

U.S. Cl. 318—687 **9 Claims**



1. A method for controlling a closed-loop linear position servo motor having an armature including a first group of excitation windings and a second group of excitation windings, and a stator including field magnets disposed radially opposite said first winding group, and feedback windings disposed radially opposite said second winding group, the method comprising the steps of:

(a) applying a positional zero reference to said feedback windings, said zero reference correlating to a zero position of said armature;

(b) monitoring time-dependent changes in the electromagnetic coupling between said feedback windings and said second armature winding group, relative to the coupling value of said zero reference;

(c) translating said electromagnetic coupling changes of said Step (b) into a positional data signal; and

(d) re-iteratively applying a compensation current to said second winding group to compensate the value of said electromagnetic coupling to thereby positionally regulate said armature in conformance with external command signals;

Contemporaneously with Steps (a) thru (d) above:

(e) applying a reference current to said first armature winding group, said reference current corresponding to an armature coupling reference value and to an armature output force reference value;

(f) monitoring time dependent changes in the electromagnetic coupling between said first armature winding group and said field magnets relative to said reference coupling value of Step (e) above;

(g) translating electromagnetic coupling changes monitored in Step (f) above into a force data signal; and

(h) re-iteratively applying a compensation current to said first winding group to compensate the value of said first group armature coupling to thereby regulate the positive and negative force of said armature in conformance with external command signals.

4,692,679

PULSE MOTOR

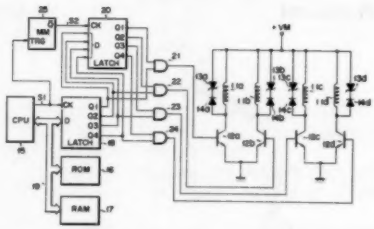
Yutaka Hujita, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,563

Claims priority, application Japan, May 21, 1985, 60-108719

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **8 Claims**



1. A pulse motor comprising:

A- and C-phase coils wound on a common pole;

B- and D-phase coils wound on a common pole;

first, second, third and fourth switching means connected in series with the A-, B-, C- and D-phase coils, respectively, and having an ON state for passing current to the respective phase coils and an OFF state for blocking current to the respective phase coils; and

control means including means for generating phase control signals for controlling respective conduction states of said first, second, third and fourth switching means to permit a sequential excitation of the A-and B-phase coils, B-and C-phase coils, C-and D-phase coils, and D-and A-phase coils in this order and so as to excite the A, C coils and B, D coils to generate, respectively, oppositely directed magnetic fluxes, and delay means for, after a predetermined time following a start of a transition from said ON state to said OFF state of one of the first, second, third and fourth switching means in the respective phase switching operation time, changing the state of another one of said switching means from the OFF state to the ON state.

4,692,680

PORTABLE BATTERY CHARGING APPARATUS AND METHODS THEREFOR

Paul Sherer, Costa Mesa, Calif., assignor to Seacliff International, Inc., South El Monte, Calif.

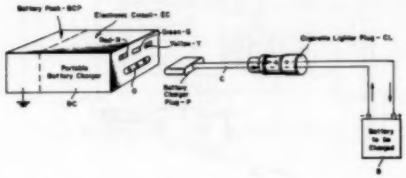
Filed Aug. 12, 1985, Ser. No. 764,656

Int. Cl.[4] H02J *7/04*

U.S. Cl. 320—2 **20 Claims**

1. Portable apparatus for charging a lead-acid battery comprising means for providing a preselected direct current volt-

age and current for charging a discharged lead-acid battery, said means including a plurality of dry cell batteries connected in a series circuit relationship, means for connecting said lead-acid battery to be charged in a series circuit relationship with said direct current means for transferring a pre-selected quantity of charge to the lead-acid battery, electronic circuit means coupled across said direct current means in a parallel circuit relationship with the lead-acid battery, the electronic circuit means including means for providing an electrical current



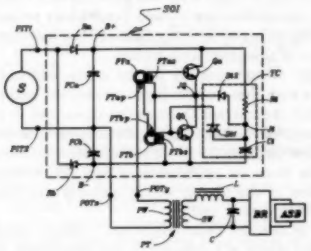
signal representative of the actual current transferred to a battery being charged, means for converging said electrical current signal to a voltage control signal, voltage controlled oscillator means coupled to be responsive to the voltage control signal for controlling the oscillation cycles thereof, and electronic counting means for accumulating the oscillator cycles therein until a preselected count is reached, the preselected count being representative of the transfer of a preselected quantity of electric charge to the lead-acid battery.

4,692,681

BATTERY CHARGER WITH ADJUSTABLE CHARGING CURRENT

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Apr. 21, 1986, Ser. No. 853,936
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—2 **20 Claims**



1. In a battery charger adapted by way of a source of AC voltage to provide battery charging current to a storage battery connected with a charger output, the improvement comprising:

charging control means: (i) connected with the source of AC voltage, (ii) receptive of magnetic flux, and (iii) operative in response to this magnetic flux to control the frequency of the AC voltage;

rectifier and current-limiting means connected with the AC voltage and operative to provide the battery charging current, the magnitude of the battery charging current being dependent on the frequency of the AC voltage; and

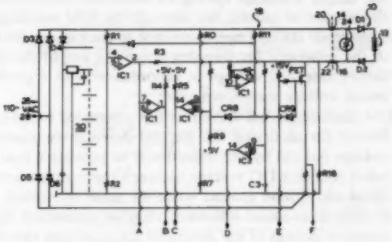
magnetic flux means magnetically coupled with the charging control means and adapted to provide controllable magnetic flux to this control means, thereby to permit control of the frequency of the AC voltage and thereby the magnitude of the charging current.

4,692,682

NICAD BATTERY CHARGER

Kerry S. Lane, Newmarket, and Derek V. Moore, Rexdale, both of Canada, assignors to Levitt Safety Limited, Canada

Filed Dec. 23, 1985, Ser. No. 812,633
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—35 **40 Claims**



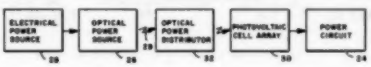
1. A method of charging a battery pack made up of one or more rechargeable cells comprising applying a charging current to said battery pack, reducing charging current when a predetermined value for a battery characteristic which includes temperature, or voltage or combination thereof is sensed, to permit said battery pack to cool for a period to a lower temperature, resuming charging said battery pack when said battery pack has cooled during said period to said lower temperature and selecting effective magnitude of charging current to prevent subsequent significant increase of battery pack temperature beyond a predetermined increment above said lower temperature.

4,692,683

OPTICAL POWER DISTRIBUTION SYSTEM

Richard G. Lalmond, Candia, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 24, 1986, Ser. No. 832,119
Int. Cl.[4] G02B 5/14
U.S. Cl. 322—2 R **7 Claims**



1. Apparatus for supplying electrical power to a plurality of electrical components mounted on a circuit board, comprising:

a printed circuit board;

a plurality of electrical components mounted on said printed circuit board;

a plurality of electrically powered sources of optical energy;

a plurality of photovoltaic cell arrays;

each photovoltaic cell array being mounted on a corresponding one of said electrical components to provide electrical power to the electrical component on which it is mounted; and

means for coupling the optical energy from said plurality of electrically powered sources of optical energy to said photovoltaic cell arrays.

4,692,684

HIGH/LOW DC VOLTAGE MOTOR VEHICLE ELECTRICAL SYSTEM

Eric S. Schaeffer, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 17, 1986, Ser. No. 908,219
Int. Cl.[4] H03J 7/14; B60L 1/02
U.S. Cl. 322—90 **4 Claims**

1. A dual voltage electrical system for a motor vehicle, comprising:

a storage battery connected between a main power terminal and system ground for providing standby power therebe-

tween at a DC voltage of predetermined low magnitude;

various DC voltage loads connected between the main power terminal and system ground for energization by the DC voltage appearing therebetween;

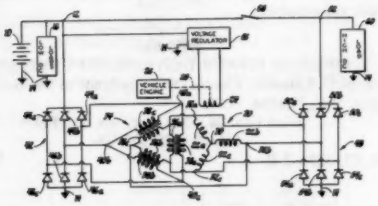
a three-phase AC generator mechanically driven by the vehicle motor and having output windings and a field winding for producing a three-phase AC voltage across the output windings having an amplitude determined by the amount of current fed through the field winding;

a three-phase transformer connected to the output windings of the generator for stepping down the amplitude of the three-phase AC voltage in accordance with a predetermined voltage step-down ratio;

a first three-phase full-wave rectifier connected to the transformer for rectifying the stepped-down three-phase AC voltage put out by the transformer to provide a first full-wave rectified DC voltage between the main power terminal and system ground when the same is enabled;

a second three-phase full-wave rectifier connected to the output windings of the generator for rectifying the three-phase AC voltage to provide a second full-wave rectified DC voltage between an auxiliary power terminal and system ground;

a voltage regulator responsive to the DC voltage appearing between the main power terminal and system ground to control the amount of current fed through the field winding of the generator to cause the amplitude of the three-



phase AC voltage produced by the generator to be correct to establish and maintain such DC voltage at the predetermined low magnitude; and

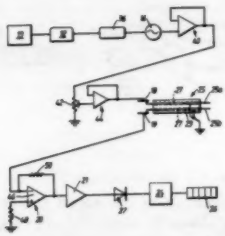
a selector switch connected between the auxiliary power terminal and the main power terminal and operable between opened and closed states such that when the switch is in the closed state the first rectifier is disabled and the three-phase AC voltage put out by the generator is at a first amplitude correct when rectified by the second rectifier to establish and maintain the DC voltage between the main power terminal and system ground at the predetermined low magnitude, and such that when the switch is in the opened state the first rectifier is enabled and the three-phase AC voltage put out by the generator is at a second higher amplitude correct when stepped down by the transformer and rectified by the first rectifier to establish and maintain the DC voltage between the main power terminal and system ground at the predetermined low magnitude and further correct when rectified by the second rectifier to establish and maintain the DC voltage between the auxiliary power terminal and system ground at a predetermined high magnitude greater than the predetermined low magnitude by a voltage step-up ratio which is the converse of the voltage step-down ratio of the transformer thereby to provide a high-magnitude DC voltage capable of energizing a high DC voltage load connected between the auxiliary power tern.. ı' and system ground.

4,692,685

ELECTRICAL MEASURING APPARATUS, AND METHODS FOR DETERMINING THE CONDITION OR IDENTITY OF BIOLOGICAL MATERIAL

Kevin L. Blaze, 29 Severn Street, Box Hill North, Victoria, Australia

Filed Mar. 14, 1985, Ser. No. 711,795
Claims priority, application Australia, Mar. 14, 1984, PG4064
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 QS **10 Claims**



1. Apparatus for determining a measure of the admittance of biological tissue and an admittance ratio for the tissue, for assessing the condition or identity of the tissue, comprising:

A pair of electrical conductors connectable to the respective contacts of a probe having a fixed spacing, between which contacts tissue is disposed in use of the apparatus;

means to generate a constant AC voltage at each of two distinct frequencies at which both the resistance and the capacitance of the tissue between said contacts are significant components of the impedance therebetween;

means to apply said constant AC voltage across said contacts first at one of said frequencies, then at the other;

precision voltage stabilization means coupled to said generation means to maintain the amplitude of said AC voltage at the two frequencies at the same accurately constant value;

buffer means in series with and between said voltage generation means and one of said conductors to minimize the loading effect of the impedance of the tissue on the impedance of the generating means;

amplifier means coupled to the other said conductor, in series with tissue when disposed between said contacts, to receive the current through the tissue and to generate an output AC voltage signal directly proportional to the current through the tissue and therefore to the admittance of the tissue on application of said AC voltage across a portion of the circuit which includes the tissue and the amplifier means; and

means to convert said output AC voltage signal to a DC output which is a measure of the admittance of the tissue between the probe contacts, the admittance ratio, for the two frequencies being thereby determinable from the respective DC outputs at the two frequencies.

4,692,686

LOW-DISTORTION LINE VOLTAGE REGULATOR

Charles E. Thomas, P.O. Box 29109, New Orleans, La. 70189

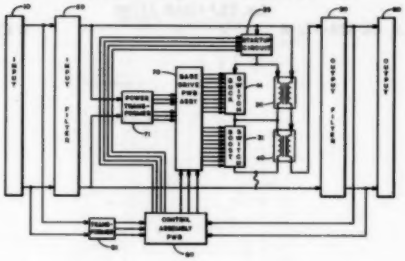
Filed Aug. 20, 1985, Ser. No. 767,624
Int. Cl.[4] G05F *1/26*
U.S. Cl. 323—263 **17 Claims**

1. An AC voltage regulator having input terminals for receiving an input voltage having a predetermined frequency, and output terminals for discharging an instantaneously-regulated output voltage, said AC voltage regulator comprising:

means for generating an AC reference voltage signal which has a frequency equal to the frequency of the input voltage, which is in phase with the input voltage, and which

has a predetermined amplitude proportional to a predetermined, desired output voltage;

comparing means for instantaneously comparing said AC reference voltage signal to a portion of the instantaneously-regulated output voltage to determine an error between



the instantaneously-regulated output voltage and said predetermined, desired output voltage; and

means for instantaneously correcting said error by altering said instantaneously-regulated output voltage to conform to said predetermined, desired output voltage.

4,692,687

OPTICAL PULSE RECEIVING DEVICE

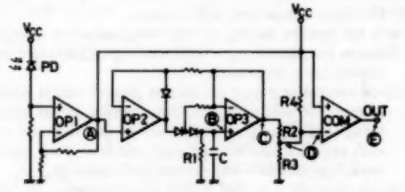
Makoto Yokoyama, Seto, Japan, assignor to Kawamura Electric Industry Co., Ltd., Seto, Japan

Filed May 9, 1986, Ser. No. 861,517

Claims priority, application Japan, May 17, 1985, 60-106664

Int. Cl.[4] G05F *1/46*

U.S. Cl. 323—284 **2 Claims**



1. An optical pulse receiving device comprising:

a. photoelectric conversion means for converting an optical pulse signal into an electric signal;

b. peak hold means for maintaining a maximum value of a signal emitted from said photoelectric conversion means;

c. thresholding means comprising resistors for dividing the voltage of said value of said peak hold means into two half voltages, said thresholding means setting a threshold voltage at a said half voltage; and

d. comparison circuit means for comparing a first output signal from said photoelectric conversion means and a second output signal from said thresholding means and emitting a pulse on the basis of the comparison of said two output signals.

4,692,688

ZERO STANDBY CURRENT SWITCH METHOD AND APPARATUS

Silvo Stanojevic, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

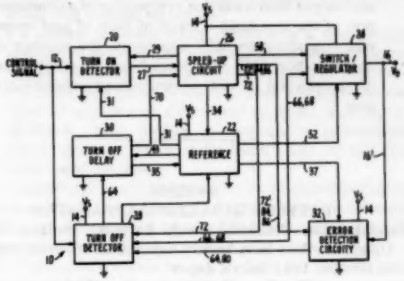
Filed Dec. 9, 1985, Ser. No. 806,738

Int. Cl.[4] G05F *1/56*

U.S. Cl. 323—285 **21 Claims**

1. A solid state apparatus responsive to a control signal for supplying power from a power source to a load comprising:

detect means having an input coupled to receive the control signal for detecting the presence of a turn on state in the control signal and an output for producing an actuate signal at said output, said detect means including circuitry for performing said detect means function that is powered initially solely from the control signal; and



supplying means coupled between the power source and the load and having an input responsive to the actuate signal for supplying power to the load, said supplying means including means for switching from an "off" state to an "on" state in response to said actuate signal, and wherein said supplying means requires no quiescent bias current in the "off" state.

4,692,689

FET VOLTAGE REFERENCE CIRCUIT WITH THRESHOLD VOLTAGE COMPENSATION

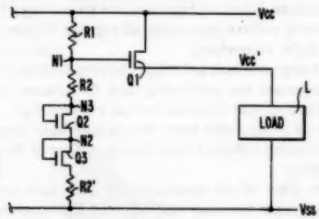
Yoshihiro Takemae, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 663,712, Oct. 22, 1984, abandoned. This application Feb. 12, 1987, Ser. No. 15,529

Claims priority, application Japan, Nov. 11, 1983, 58-212083

Int. Cl.[4] G05F *3/24*

U.S. Cl. 323—313 **10 Claims**



1. A voltage converting circuit for receiving a power source voltage and providing a constant voltage having a level of a predetermined proportional division of said power source voltage, comprising:

an output MIS transistor, having a gate and a threshold voltage, for outputting said constant voltage, wherein the gate of said output MIS transistor receives a gate control voltage; and

gate control means for providing said gate of said output MIS transistor with said gate control voltage, comprising

an output node for outputting said gate control voltage,

resistive means, including pairs of resistive elements connected in series via said output node and connected to receive said power source voltage, for determining said predetermined proportional division, each resistive element having a resistance being independent of said threshold voltage, and

compensating means, including a plurality of compensation MIS transistors connected in series with said resistive means, for compensating for the value of the threshold voltage of said output MIS transistor in the value of said gate control such that said constant voltage corresponding to said predetermined proportional division is output by said output MIS transistor irrespective of a common variation of the threshold voltage of each of said output and said compensation MIS transistors, the number of said compensation MIS transistors being in accordance with the proportion of said predetermined proportional division.

4,692,690

PATTERN DETECTING APPARATUS

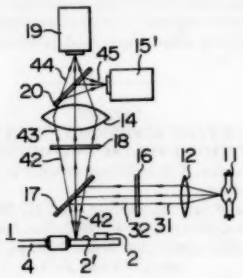
Yasuhiko Hara, Machida; Koichi Karasaki, Hadano; Noriaki Ujiie, and Akira Sase, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 686,007

Claims priority, application Japan, Dec. 26, 1983, 58-243850; Dec. 26, 1983, 58-243851

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—73 PC **9 Claims**



1. A pattern detecting apparatus for inspecting a body which has a wiring pattern on a material capable of generating fluorescent light, comprising:

a light source which emits light having both an exciting light component for generating said fluorescent light from a surface of said material and an infrared light component which is separable from the exciting light component for producing reflected light from a surface of the said wiring pattern;

a first filter which transmits not only said exciting light component but also said infrared light component from the said light source;

a first mirror which directs light received from said first filter to the said body and which transmits fluorescent light from the body and reflected light from the body;

a second filter which transmits the fluorescent light received via said first mirror and the reflected light received via said first mirror, and which removes all exciting light reflected from the body through the first mirror;

an optical system which includes a second mirror, a fluorescent light detector, a reflected-light detector and a lens for focussing the fluorescent light received from said second filter on said fluorescent-light detector via said second mirror and for focussing the reflected light received from said second filter on said reflected-light detector via said second mirror; and

a detection circuit including means for contracting, enlarging and masking pattern images detected by the said detectors.

4,692,691

TEST SYSTEM FOR KEYBOARD INTERFACE CIRCUIT

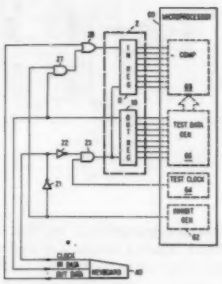
Yoshihisa Sueta, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1985, Ser. No. 806,077

Claims priority, application Japan, Dec. 14, 1984, 59-263156

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 324—73 R **4 Claims**



1. A test system for identifying an error condition between a keyboard interface and a processor comprising, in combination,

a first shift register for storing, shifting and outputting coded data signals generated by said keyboard,

a second shift register for storing, shifting and inputting coded data signals to be supplied to said keyboard,

clock means for generating first and second timing signal sequences to facilitate operation of said first and second shift registers,

means connecting the output of said second shift register to the input of said first shift register,

said test system having an operating sequence comprising means for generating a test clock signal sequence and an inhibit signal sequence,

clock switching means responsive to said inhibit signal sequence for inhibiting said first timing signal sequence being applied from said keyboard to said first and second shift registers and for applying said test clock signal sequence to said first and second shift registers,

means responsive to said inhibit signal sequence for inhibiting coded data signals being applied from said keyboard to said first shift register, and

comparison means for comparing said test clock signal sequence applied to said second shift register with the output signals from said first shift register to identify an error condition associated with said first and second shift registers.

4,692,692

ELECTRONIC APPARATUS FOR DETECTING STRAY VARIATIONS IN AN ELECTRICAL VOLTAGE AS A FUNCTION OF TIME

Jean-Paul Prulhiere, Chambray-les-Tours, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 4, 1985, Ser. No. 784,119

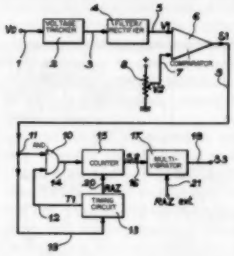
Claims priority, application France, Oct. 5, 1984, 84 15300

Int. Cl.¹ G08B *21/00*

U.S. Cl. 324—102 **11 Claims**

1. Apparatus for detecting the presence, in an alternating electrical signal having a low frequency component and which may contain background noise and parasitic signals, of a desired signal comprising a packet of elevated frequency oscillations exceeding a predetermined number of oscillation cycles, the apparatus comprising means for filtering the electrical signal to remove therefrom the low frequency component and to diminish the parasitic signals; means for rectifying the fil-

tered signal to convert the filtered signal to a unipolar signal; means for comparing the unipolar signal to a predetermined reference level; means for determining a number of calibrated pulses produced during a preselected period of time, the preselected period of time being sufficient for the oscillations of the



desired signal to exceed said predetermined number of oscillation cycles; and means responsive to the determining means for furnishing an output signal upon the number of said calibrated pulses exceeding, within said preselected period of time, said predetermined number of oscillation cycles in order to indicate the presence of said desired signals.

4,692,693

APPARATUS FOR MEASURING LOW CURRENTS WITH HIGH DYNAMICS

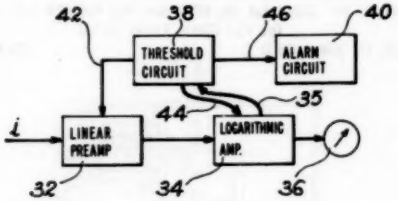
Serge Rabeyrolles, Cestas, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 24, 1985, Ser. No. 694,439

Claims priority, application France, Jan. 27, 1984, 84 01317

Int. Cl.[4] G01R *15/08*

U.S. Cl. 324—123 R **2 Claims**



1. An apparatus for measuring low electric currents with high dynamics comprising:

(a) a linear preamplification having an input for receiving a low current signal and an output providing a voltage signal, said linear preamplifier comprising:

(1) a first differential amplifier having an inverting input, a non-inverting input and an output, said low current signal being applied to said inverting input;

(2) a first feedback chain comprising a plurality of impedance groups, each of said groups being connectable between said output and said inverting input of said first differential amplifier, each of said groups comprising in series a switch and an impedance element, said switch being connectable to said output, and said impedance element being connectable to said inverting input;

(3) means for controlling each switch of said impedance groups;

(4) a zero point adjustment means for adjusting an offset of said preamplifier, comprising a first preset control means connected to said first differential amplifier, and a fine adjustment means connected to the non-inverting input of said differential amplifier;

(5) a testing means for testing a gain of said first differential amplifier, said testing means being connectable to the inverting input of said first differential amplifier;

(6) a second differential amplifier having an inverting input, a non-inverting input and an output constituting said preamplifier output, said non-inverting input being connected to said output of said first differential amplifier, and said second differential amplifier output delivering said voltage signal; and

(7) a second feedback chain comprising a first resistor connected between the inverting input and the output of said second differential amplifier, and a second resistor connected between earth ground and the inverting input of said second differential amplifier, said second feedback chain having an impedance substantially lower than the said first feedback chain of said first differential amplifier;

(b) a logarithmic amplifier having an input connected to the output of said linear preamplifier, and a logarithmic amplifier output supplying an amplified voltage signal, said logarithmic amplifier including a gain control input;

(c) a thresholding means having an input for receiving the amplified voltage signal supplied by said logarithmic amplification means and supplying, as a function of said amplified voltage signal:

(1) a control signal for controlling the said switches of the impedance groups of the first feedback chain of said first differential amplifier,

(2) an alarm signal when a level of said amplified voltage signal is higher than a predetermined level, and

(3) a gain control signal to the gain control input of said logarithmic amplification means;

(d) an alarm means receiving said alarm signal and triggering an alarm as a function of said alarm signal; and

(e) a reading means for displaying the amplified voltage signal supplied by said logarithmic amplifier.

4,692,694

LOAD TESTING APPARATUS FOR ELECTRONIC COMPONENTS

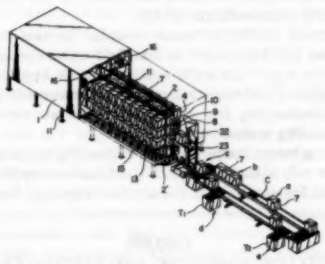
Satoru Yokoi, and Hirokazu Kondo, both of Osaka, Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan

Filed Aug. 29, 1984, Ser. No. 645,364

Claims priority, application Japan, Nov. 28, 1983, 58-182077[U]

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—158 F **4 Claims**



3. A load testing apparatus for testing electronic components by applying direct current power at high temperatures, said apparatus comprising:

a high temperature compartment,

a plurality of shelf frames connected with one another in a multiple-row endless arrangement, said shelf frames being disposed generally in said compartment, but with extended portions extending outside of said compartment,

a plurality of shelves mounted in multiple layers on said frames, said shelves being contained entirely in said com-

partment, and each shelf receiving a plurality of the electronic components therein,

contact elements on each shelf for feeing direct current to the electronic components therein,

driving means operatively connected to the extended portions of each of said shelf frames for horizontally circulating said frames within said compartment, said driving means being provided outside of said compartment,

an AC feed rail disposed outside of said compartment,

a plurality of rectifiers positioned outside of said compartment, each rectifier being fixed to and movable with the extended portion of each of said shelf frames, each rectifier being electrically connected by cable means to said contact elements on the shelves of a corresponding shelf frame for proving direct current thereto and having a current-collecting trolley in slide contact with said AC feed fail for receiving AC power.

4,692,695

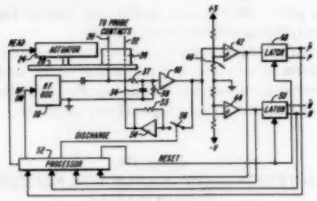
CONDUCTIVITY-TYPE SENSOR

Noel S. Poduje, Needham Heights, Mass., assignor to ADE Corporation, Newton, Mass.

Continuation of Ser. No. 379,560, May 18, 1982, abandoned. This application May 19, 1986, Ser. No. 865,939

Int. Cl.[4] G01R *31/26;* **H05F** *3/00*

U.S. Cl. 324—158 R **6 Claims**



1. A testing system for a semiconductor wafer having a conductivity-type to be determined and an undesirable surface static charge to be discharged, comprising:

means for electrically and mechanically contacting said wafer;

sensing means coupled to said contacting means for providing a first signal indicating the polarity of the static charge on said semiconductor wafer;

accelerated discharge means coupled to said contacting means and responsive to said first signal for applying a second signal having a polarity that is opposite to the polarity of said static charge to said semiconductor wafer for discharging the static charge thereon through said contacting means; and

detecting means coupled to said contacting means and operative only after said second signal has been applied to said wafer for determining the conductivity-type thereof.

4,692,696

METHOD FOR ADJUSTING AND TESTING CURRENT SENSORS

Bernard D. Bray, Sycamore, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Jul. 29, 1985, Ser. No. 760,210

Int. Cl.[4] G01R *35/00, 31/02*

U.S. Cl. 324—158 R **9 Claims**

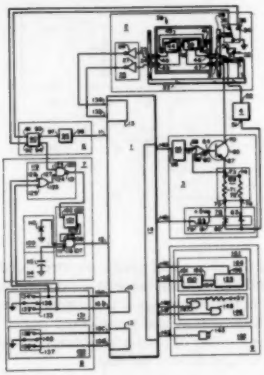
1. A method of adjusting and testing a current sensing apparatus to a predetermined operated condition and a predetermined non-operated condition, comprising the steps of:

automatically applying a threshold current value to said apparatus, under control of a microcomputer;

automatically adjusting said apparatus to a state just past the threshold of operation, under control of a microcomputer;

automatically applying a non-operate current value to said apparatus, under control of a microcomputer;

automatically first checking said apparatus for a nonoperate output signal, under control of a microcomputer;



automatically applying an operate current value to said apparatus, under control of a microcomputer; and

automatically second checking said apparatus for an operate output signal, under control of a microcomputer.

4,692,697

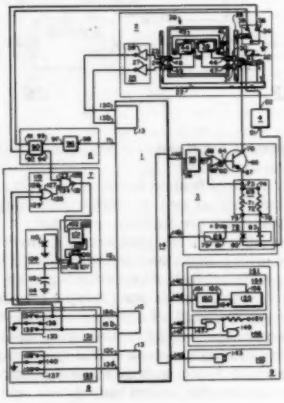
CURRENT SENSOR ADJUSTMENT AND TEST APPARATUS

Bernard D. Bray, Sycamore, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Jul. 29, 1985, Ser. No. 760,228

Int. Cl.[4] G01R *35/00, 31/02*

U.S. Cl. 324—158 R **21 Claims**



1. Apparatus for adjusting and checking a current sensor including a Hall Effect Switch and an electromagnetic coil for operating said switch, said apparatus comprising:

a microprocessor connected to said current sensor;

a constant current source;

a test power source including a ground terminal and a power terminal; and said constant current source including a digital-to-analog converter connected to said micro-

processor, an operational amplifier connected via a noninverting input to an output of said converter, a current pass transistor including a base terminal connected to an output of said operational amplifier and having a collector terminal connected to a first terminal of an electromagnetic coil of said current sensor under test, and at least one constant sensing element including a first terminal connected to an emitter terminal of said current pass transistor and also to an inverting input of said operational amplifier, said current element including a second terminal connected to said test power source ground terminal; and said coil connected to said power source power terminal via a second terminal;

said constant current source, operated in response to said microprocessor to apply at least a first and a second current value to said coil, said coil generating magnetic flux of different levels in response to said first and said second current values, said Hall Effect switch transmitting a first output signal to said microprocessor in response to the presence of a magnetic flux within a first predetermined range, and in the alternative said Hall Effect switch operated to transmit a second output signal to said microprocessor in response to the presence of magnetic flux within a second predetermined range;

indicating means connected to said microprocessor, operated in response to said microprocessor receiving at least one of said output signals to provide an indication of the operation of said sensor.

4,692,698

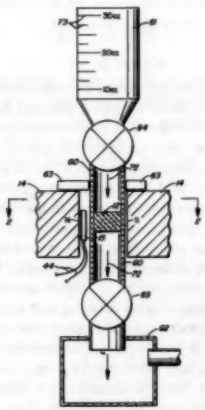
METHOD AND DEVICE INCLUDING A BED OF FERROMAGNETIC FIBERS AND MAGNETIC FLUX SENSOR FOR MEASURING THE AMOUNT OF MAGNETIC PARTICLES ON A LIQUID

Robert T. Lewis, Albany, Calif., assignor to Tribometrics, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 764,552, Aug. 12, 1985. This application May 7, 1986, Ser. No. 860,575

Int. Cl.[4] **G01N** *27/74;* **G01R** *33/12*

U.S. Cl. 324—204 **16 Claims**



1. A device for measuring the amount of magnetic particles in a liquid, said device including a magnet, a bed of ferromagnetic fibers supported in the magnetic field of said magnet to capture said particles as said liquid is passed through said bed and a means to measure the magnetic flux of the captured particles, wherein the improvement comprises:

means providing a flow path for said liquid including said bed and a means to flow a known amount of said liquid along said flow path through said bed, said magnet comprising a pair of pole faces between which said bed is supported and having sufficient strength to substantially completely magnetize said particles, and said means to measure the magnetic flux comprising a magnetic flux sensor positioned between a pole face of said magnet and said bed, said bed being dimensioned such that the distance from said sensor to the fibers in said bed farthest from said sensor is not greater than about 6 millimeters.

4,692,699

RADIAL DISPLACEMENT MAGNETIC DETECTOR DEVICE FOR A ROTOR

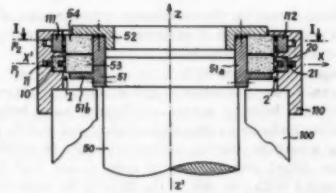
Maurice L. Brunet, Saint Marcel, and Jean-Pierre Jolivet, Gasny, both of France, assignors to Societe Anonyme Styled: Societe Europeenne de Propulsion, Puteaux, France

Filed Sep. 12, 1985, Ser. No. 775,438

Claims priority, application France, Sep. 19, 1984, 84 14374

Int. Cl.[4] **G01B** *7/14, 7/31;* **F16C** *41/00*

U.S. Cl. 324—207 **10 Claims**



1. A radial displacement magnetic detector device for a rotor mounted relative to a stator on active magnetic bearings for rotation about an axis of rotation, comprising:

a plurality of inductive elements integral with the stator on which are mounted said bearings; and

at least one magnetic flux conducting reference ring integral with the rotor, confronting said inductive elements and defining with said inductive elements a variable air-gap therebetween;

said inductive elements each include a magnetic circuit element having a U-shaped cross-section viewed along the axis of rotation of the rotor and a coil adapted for connection to a source of excitation mounted to the magnetic circuit element such that the coil induces an axial magnetic flux in the confronting reference ring;

said inductive elements being distributed in axially spaced first and second radial planes;

said at least one magnetic flux conducting reference ring including a first magnetic flux conducting reference ring integral with said rotor in said first plane;

said inductive elements including first and second diametrically opposite inductive elements in said first plane operatively associated with said first reference ring;

said at least one magnetic flux conducting reference ring further including a second magnetic flux conducting reference ring integral with the rotor in said second plane;

said inductive elements further including third and fourth diametrically opposite inductive elements in said second plane operatively associated with said second reference ring;

each of said inductive elements extending over a circular arc of substantially 120 degrees, the coils of said inductive elements collectively providing an output indication of the radial displacement of said rotor with respect to the stator.

4,692,700
ROLLING MAGNETIC PROBE FOR CONTINUOUS THICKNESS MEASUREMENT

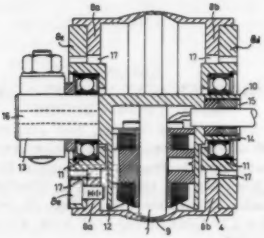
Hans F. Nix, Cologne, Fed. Rep. of Germany, assignor to Elektro-Physik Hans Nix & Dr.-Ing. E. Steingroever KG, Cologne, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,719

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401466

Int. Cl.[4] G01B *7/10*; G01R *33/12*

U.S. Cl. 324—229 **22 Claims**



1. Probe means for the continuous measurement of the thickness of a moving strip of material, or of a layer deposited on said moving strip, comprising:

measurin gpole means;

external housing means for said measuring pole means, said external housing means configured as a hollow roller means including a ring-shaped crowned middle part forming a narrow running surface pivotally mounted for rotation about said measuring pole means and for rolling contact with one side of the strip to be measured;

ferromagnetic supporting surface means for contact with the other side of said strip; and

said measuring pole means mounted within said hollow roller means whereby said measuring pole means is within said crowned middle part and continuously spaced from said one side of the strip by said roller means.

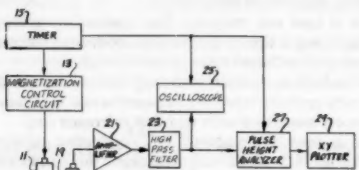
4,692,701
METHOD OF TESTING STEAM TURBINE ROTORS TO DETERMINE IF THEY SHOULD BE RETIRED BECAUSE OF EMBRITTLEMENT

Robert E. Dundas, Duxbury, and Fred W. Tatar, Dedham, both of Mass., assignors to Factory Mutual Research, Norwood, Mass.

Filed Dec. 13, 1984, Ser. No. 681,280

Int. Cl.[4] G01N *27/82*; G01B *7/24*

U.S. Cl. 324—240 **8 Claims**



1. A method of testing a steam turbine rotor in order to avoid failure of said rotor comprising testing said steam turbine rotor for embrittlement, wherein said embrittlement testing includes subjecting portions of the steam turbine rotor which may become embrittled to a magnetic field varying over a time interval with a predetermined waveform to generate a magnetic flux in said rotor and cause a detectable Barkhausen effect in said magnetic flux, said Barkhausen effect being characterized by step changes in said magnetic flux, generating pulses in response to said step changes in magnetic flux and comparing the Barkhausen effect as represented by the pulses produced from said rotor with Barkhausen data obtained from a test sample.

4,692,702
DEVICE WITH TWO GENERATORS FOR MEASURING THE GRADIENTS OF MAGNETIC FIELDS

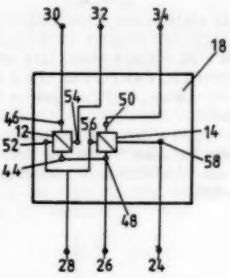
Gerhard Hüschelrath, Laufach-Frohnhofen, and Herbert Diehl, Erlensee, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau an Main, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,258

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435455

Int. Cl.[4] G01R *33/06, 33/022*; G01N *27/87*

U.S. Cl. 324—251 **5 Claims**



1. A device with two multiple electrode Hall generators for measuring the gradients of magnetic leakage fields in the non-destructive testing of materials, characterized in that the Hall generators comprise thin rectangular wafers each arranged with a broad surface thereof lying on a flat rectangular shaped, four sided substrate, said Hall generators being spaced apart longitudinally along a common line with the same alignment to the line respectively and close to the periphery of two opposite sides of the substrate respectively, the two sides being free of connections, a rectangular-shaped, four sided housing having six external connections, three of which are arranged on one side of the rectangular-shaped housing and three of which are arranged on the opposite side, the other two opposite sides of said housing being free of external connections, said housing overlying the substrate, with the two opposite sides of said substrate which are free of connections being adjacent the opposite sides of said housing which are free of external connections, respectively, with one control electrode of each Hall generator being together joined to a first external connection, with one other control electrode of each Hall generator being joined, respectively, to second and third external connections, with two Hall electrodes, one from each Hall generator, whose opposite polarities correspond respectively to the Hall voltages of said two Hall generators, being joined together to a fourth external connection, and with the other Hall electrode of each Hall generator being, respectively, joined to fifth and sixth external connections.

4,692,703

MAGNETIC FIELD SENSOR HAVING A HALL EFFECT DEVICE WITH OVERLAPPING FLUX CONCENTRATORS

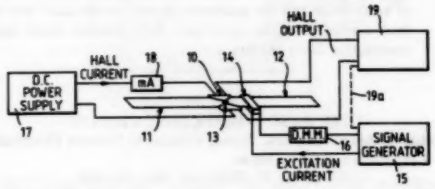
Philip Extance; Roger E. Jones, both of Cambridge, England, and Stewart O. Martin, Adelaide, Australia, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Feb. 22, 1985, Ser. No. 704,253

Claims priority, application United Kingdom, Feb. 25, 1984, 8404967

Int. Cl.[4] G01R *33/06*

U.S. Cl. 324—251 15 Claims



1. A magnetic field sensor comprising:

a Hall effect device with a Hall element and flux concentrator means associated with the Hall element;

means for generating a varying magnetic field in the flux concentrator means such as to drive said flux concentrator means alternately into or out of magnetic saturation, said varying magnetic field generating means comprising a coil through which said flux concentrator means extends, and means for generating an a.c. excitation current and applying said a.c. excitation current to said coil during use of the sensor; and

means for detecting a second harmonic term in the output voltage of the Hall element when a Hall current is applied to the Hall element and in the presence of a d.c. magnetic field, the amplitude of said second harmonic term providing a measure of the d.c. magnetic field.

4,692,704

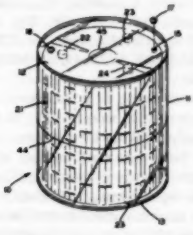
SLICE THICKNESS AND CONTIGUITY PHANTOM FOR A MAGNETIC RESONANCE IMAGING SCANNER

Joel E. Gray, Rochester, Minn., assignor to Mayo Medical Resources, Rochester, Minn.

Filed Feb. 6, 1986, Ser. No. 826,747

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 32 Claims



1. A phantom for calibrating a magnetic resonance imaging system comprising:

a hollow enclosure adapted to be inserted into a magnetic resonance imaging system;

a plurality of generally planar leaves positioned in a stacked relationship, each leaf having a portion thereof removed to form a slice, said leaves being oriented in said stack with said slices in predetermined positions; and

means for attaching said stack of leaves inside said hollow enclosure whereby said leaves form a predetermined calibration image upon being subjected to a magnetic field in a magnetic resonance imaging system.

4,692,705

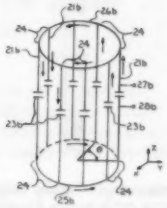
RADIO FREQUENCY FIELD COIL FOR NMR

Cecil E. Hayes, Wauwatosa, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 23, 1983, Ser. No. 565,254

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 72 Claims



1. An NMR radio-frequency (RF) coil comprising:

a pair of conductive end-cap elements disposed in a spaced-apart relation along a common longitudinal axis; and

a plurality of conductive segments each having at least one reactive element in series therewith, said segments electrically interconnecting said end-cap elements at points spaced along the periphery of each of said end-caps, said segments being disposed substantially parallel to said longitudinal axis such that the resulting configuration has four-fold symmetry.

4,692,706

WELL LOGGING MEANS AND METHOD FOR DETERMINING WATER SATURATION OF A PETROLEUM RESERVOIR HAVING TWO TRANSMITTERS AND TWO RECEIVERS

Roy P. Mazzagatti, Bellaire, and Donald J. Dowling, Houston, both of Tex., assignors to Texaco Inc, White Plains, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,376

Int. Cl.[4] G01V *3/30*

U.S. Cl. 324—338 10 Claims

1. A well logging system for determining the water saturation of a petroleum reservoir earth formation comprising:

a well logging sonde which includes:

first transmitter means for transmitting electromagnetic energy into the earth formation at a first frequency selected from a range of frequencies from 0.01 MHz to 100 MHz,

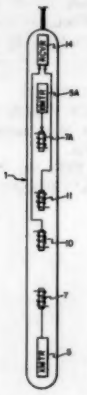
second transmitter means for transmitting electromagnetic energy into the earth formation at a second frequency selected from the range of frequencies,

first receiving means spaced predetermined distances from said first and second transmitter means for receiving the transmitted electromagnetic energies from the earth formation and providing a signal corresponding thereto,

second receiving means spaced predetermined distances from the first and second transmitting means for receiving the transmitted electromagnetic energies from the earth formation and providing a signal corresponding thereto, and

processing means for processing the signals provided by both receiving means to provide an output signal related to the received electromagnetic energies;

well logging cable means for conducting the output signal from the well logging sonde to the surface; and



means at the surface receiving the output signal provided by the well logging cable means for deriving the water saturation of the petroleum reservoir earth formation in accordance with the received electromagnetic energies.

4,692,707

METHOD AND APPARATUS FOR MEASURING THE EARTH FORMATION RESISTIVITY OF A PLURALITY OF RADIAL REGIONS AROUND A BOREHOLE

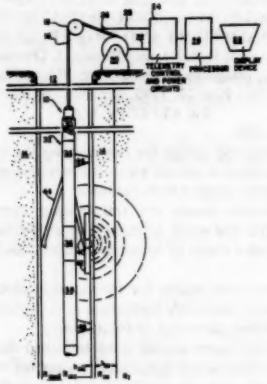
Stanley Locke, and Michel Gouilloud, both of Norwalk, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,414

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] G01V *3/20*

U.S. Cl. 324—374 **14 Claims**



1. An apparatus for providing signals indicative of the electrical resistivity of a subsurface formation traversed by a borehole, comprising:

an elongate sonde body adapted for longitudinal movement though said borehole, said body including a first electrically conductive body section operative to emit electrical current, an insulating section, and a second electrically conductive body section in endwise connection;

a pad connected to said sonde body and having a borehole wall engaging face of conductive material, said pad including at least three current electrodes disposed at different longitudinal locations along said conductive face, said electrodes being operative to emit survey current;

means electrically connected to said conductive face and to said first conductive body section for maintaining said conductive face and said first conductive body section at substantially equal electrical potentional;

electrical conductor means carried by said apparatus for returning current emitted from said first conductive body section and said conductive face; and

means connected to said pad and to said sonde body for urging said conductive face into engagement with the wall of a borehole and for maintaining said conductive face at least partially within a current field emitted from said conductive body section.

4,692,708

TIME BASE CORRECTION CIRCUIT

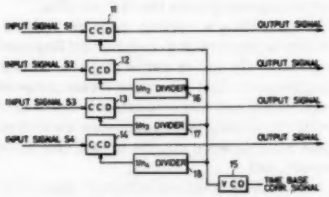
Tetsuo Shimizu, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,356

Claims priority, application Japan, Feb. 29, 1984, 59-29643[U]

Int. Cl.[4] H03K *1/17, 5/13;* **H04N** *5/78, 9/89*

U.S. Cl. 328—63 **2 Claims**



1. In a time base correction circuit comprising: a plurality of clocked delay elements for correcting the same time base error present in a plurality of input signals, and a single clock generator for supplying clock pulse signals to said clocked delay elements, the improvement wherein a frequency divider is provided between said clock generator and each clocked delay element other than the one to which an input signal among said plurality of input signals having a highest maximum frequency is supplied.

4,692,709

PARALLEL INPUT SIGNAL PROCESSOR FOR LOW-LEVEL SIGNAL, HIGH-NOISE ENVIRONMENTS

Vladimir A. Shvartsman, Louisville, Ky., assignor to Electronic Design & Research, Inc., Louisville, Ky.

Filed Apr. 5, 1985, Ser. No. 720,264

Int. Cl.[4] H03K *5/22, 19/23;* **H03F** *1/26*

U.S. Cl. 328—108 **4 Claims**

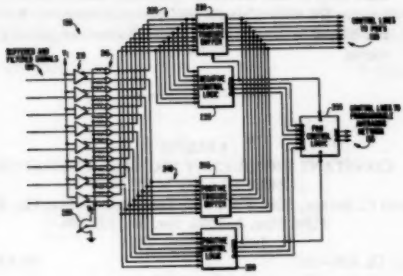
1. A device for receiving M input signals and processing at least N of M input signals, said at least N of M input signals being processed only if said at least N input signals have identical instantaneous polarities with respect to a predetermined and user-adjustable threshold value and comprise at least a majority of the M input signals, said device comprising:

threshold value determination means for outputting a predetermined threshold value, said threshold value being variable and adjustable by a user;

threshold means connected to said threshold value determination means for receiving said predetermined threshold value and the M input signals and determining the instantaneous polarity of each of the M input signals with respect to said predetermined threshold value;

N-signal selection means connected to said threshold means for selecting said N of M input signals having identical

instantaneous polarities with respect to said predetermined threshold value and not selecting the (M-N) input signals whose instantaneous polarities are not identical with respect to the instantaneous polarities of said N input signals;



determination means connected to said N-signal selection means for outputting a control signal indicative of the value of N; and

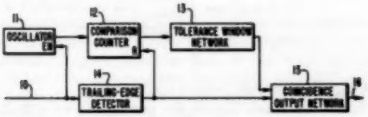
processing means connected to said N-signal selection means for processing said N selected signals according to said control signal if and only if said control signal is indicative of the fact that N is greater than M/2.

4,692,710

FUNDAMENTAL AND HARMONIC PULSE-WIDTH DISCRIMINATOR

Vladimir A. Shvartsman, Louisville, Ky., assignor to Electronic Design & Research, Inc., Louisville, Ky.

Filed Sep. 4, 1985, Ser. No. 772,471
Int. Cl.[4] H03K *9/08*
U.S. Cl. 328—111 **28 Claims**



1. A device for indicating whether an input pulse, having a leading edge, an unknown width, and a trailing edge, is at least as wide as a predetermined minimum pulse width and within a predetermined tolerance window, said device comprising:

first oscillator means, enabled by the leading edge of the input pulse, for outputting pulses at a first frequency;

first comparison counter means, coupled to said first oscillator means, for counting said first frequency pulses, comparing said first frequency pulse count to a first predetermined value representative of the minimum pulse width, and outputting a trigger pulse when said first frequency pulse count reaches said first predetermined value;

tolerance window means, coupled to said first comparison counter means, for receiving said trigger pulse and outputting a pulse having a first pulse-width duration representative of the tolerance window;

trailing-edge detector means, enabled by the trailing edge of the input pulse, for outputting a pulse having a second pulse-width duration; and

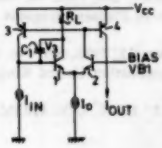
coincidence output means, having a first input coupled to said tolerance window means and a second input coupled to said trailing-edge detector means, for outputting a pulse having a third pulse-width duration when said first pulse-width duration and said second pulse-width duration are in coincidence.

4,692,711

CURRENT MIRROR CIRCUIT

Yoji Miyasako, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 7, 1986, Ser. No. 882,356
Claims priority, application Japan, Jul. 17, 1985, 60-157890
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—257 **3 Claims**



1. A current mirror circuit comprising:

first and second transistors which have their emitters in common and constitute a differential amplification circuit;

third and fourth transistors which have their bases in common;

emitters of said first and second transistors are coupled with a constant current source;

a collector of said second transistor is coupled with bases of said third and fourth transistors;

a collector of said third transistor is coupled with a base of said first transistor and an input current source;

a base of said second transistor is coupled with a bias node;

emitters of said third and fourth transistors are coupled with a reference power source;

a collector of said fourth transistor is coupled with an output node;

a collector of said first transistor is coupled with said reference power source through a load resistance; and

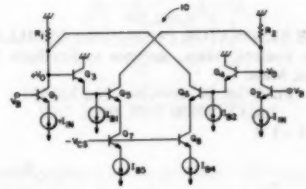
a capacitor for coupling the base and the collector of said first transistor each other.

4,692,712

DIFFERENTIAL IMPEDANCE NEUTRALIZATION CIRCUIT

Patrick A. Quinn, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 14, 1986, Ser. No. 917,867
Int. Cl.[4] H03F *3/45, 1/26*
U.S. Cl. 330—261 **5 Claims**



1. A parasitic impedance neutralization circuit for an amplifier, comprising:

means for sensing an output signal at opposing output terminals of the amplifier and reproducing each output signal in isolation from each output terminal, the parasitic impedance at each terminal producing a distortion signal;

neutralizing impedances proportional to the parasitic impedances at each output terminal;

means coupled to the sensing means for applying the isolated output signal from each terminal across a neutralizing impedance to produce a correction signal proportional to

but opposite in sign to the distortion signal produced by the parasitic impedance at the opposite terminal; and

means for passing each correction signal to the opposite terminal to be summed with the distortion signal to provide a substantially error-free output signal.

4,692,713

READ ONLY MEMORY CONTROL CIRCUIT FOR USE IN A PHASE LOCK LOOP

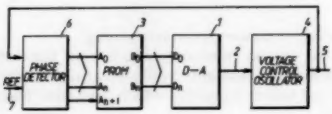
Brian Cordwell, Merley, and Paul M. Hayes, Poole, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Dec. 11, 1985, Ser. No. 807,629

Claims priority, application United Kingdom, Dec. 21, 1984, 8432552

Int. Cl.[4] H03L *7/08*; H03M *1/70*

U.S. Cl. 331—1 A **7 Claims**



1. A control circuit comprising:

(A) An addressable memory, said addressable memory having a first storage area comprising n/2 addressable words and a second storage area comprising n/2 addressable words;

(B) addressing means to cause ouput of a word from said first storage area in dependence upon digital signals applied to address inputs of said addressable memory;

(C) means to cause a change of addressing from the word addressed in said first storage area to a corresponding word in the second storage area to cause output of said corresponding word in place of the first said word;

each of said n/2 addressable words in said first storage area representing a respective predetermined value and each of said n/2 addressable words in said second storage area representing a respective predetermined value; each of said respective predetermined values stored in said second storage area equalling a corresponding one of said respective predetermined values stored in the first storage area incremented by a fixed value, the circuit effecting a predetermined stepwise change in output value on change of addressing from one of said first or second storage areas to a corresponding one of said second or first storage areas.

4,692,714

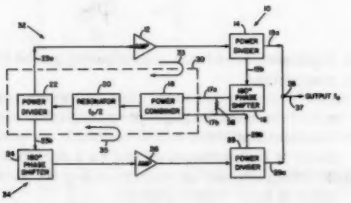
SINGLE RESONATOR PUSH-PUSH OSCILLATOR

Zvi Galani, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 20, 1986, Ser. No. 920,403

Int. Cl.[4] H03B *5/18*; H03L *7/02*

U.S. Cl. 331—1 R **6 Claims**



1. A microwave push-push oscillator utilizing first and second active amplifying elements, each amplifying element having a feedback loop and an output, comprising:

(a) a resonator;

(b) first means for connecting said resonator in the feedback loop of siad first amplifying element;

(c) second means for connecting said resonator in the feedback loop of said second amplifying element; and

(d) means for maintaining a 180° phase relationship between the output of said first and said second amplifying elements.

4,692,715

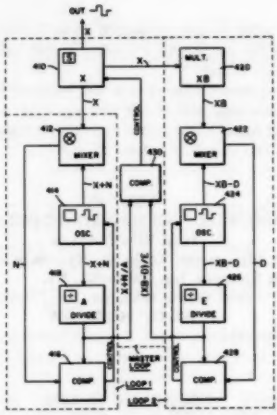
CONSTANT FREQUENCY SIGNAL GENERATOR CIRCUIT AND METHOD

Lewis C. Spence, 3084 N.W. 74th Ter., Okeechobee, Fla. 33472

Filed Mar. 3, 1986, Ser. No. 835,295

Int. Cl.[4] H03L *7/06*

U.S. Cl. 331—2 **20 Claims**



1. A signal generator, which comprises:

(a) master oscillator means for generating an output signal having a preselected frequency value X;

(b) first loop means connected to said master oscillator means, and having a first local oscillator means, for generating in response to said output signal a first comparator signal having a first value indicative of the frequency deviation of said output signal from said preselected frequency value X;

(c) second loop means, connected to said master oscillation means, and having a second local oscillator means, for generating in response to said output signal a second comparator signal having a second value indicative of the frequency deviation of said output signal from said preselected frequency value X, said second value having an offset component which is twice the offset component of said first value for a given frequency deviation of said output signal from said preselected frequency value X; and

(d) master loop means, connected to said master oscillator means, first loop means and second loop means, for producing a master control signal in accordance with the difference between said offset component of first comparator signal and said offset component of said second comparator signal, said master control signal being supplied to said master control means to cause said output signal to be changed to have said preselected frequency value X.

4,692,716

METHOD AND A DEVICE FOR THE FREQUENCY CONTROL OF AN ATOMIC OR MOLECULAR BEAM FREQUENCY STANDARD

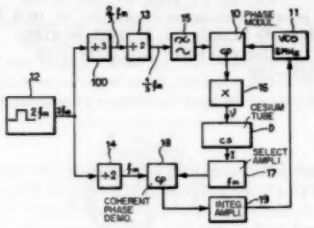
Andrea De Marchi, Via Sperino 13, Lessona (Vercelli), and Giovanni D. Rovera, Paesana, both of Italy, assignors to Andrea DeMarchi, Lessona, Italy

Filed May 21, 1986, Ser. No. 866,202

Claims priority, application Italy, May 20, 1985, 20790 A/85

Int. Cl.⁴ H03L *7/26*

U.S. Cl. 331—3 **5 Claims**



1. A method for the frequency control of a frequency standard including an atomic or molecular beam device with two cavities to which an electromagnetic field is fed, whose frequency is modulated in time in a substantially sinusoidal way about an interrogation frequency near to the characteristic frequency of a selected transition of the atoms or molecules of said beam, and in which device a current is generated proportional to the number of atoms or molecules of the beam which have undergone said transition as an effect of their passage through the cavities; the method including the phases of:

generating a control signal as a function of a preselected detected characteristic of said current, and

modifying the frequency of said field as a function of said control signal, in such a way as to minimize the difference between said characteristic frequency and the interrogation frequency,

the improvement therein is in the fact that from said current the component is extracted whose frequency is an odd harmonic, higher than the first, of the frequency which modulates the interrogation frequency, and that said control signal is generated by coherently demodulating said component, in amplitude and sign.

4,692,717

VOLTAGE CONTROLLED OSCILLATOR WITH HIGH SPEED CURRENT SWITCHING

Kenneth W. Ouyang, Huntington Beach, and Melvin Marmet, Placentia, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation of Ser. No. 839,504, Mar. 14, 1986, abandoned. This application Dec. 8, 1986, Ser. No. 940,212

Int. Cl.⁴ H03K *3/023, 3/354*

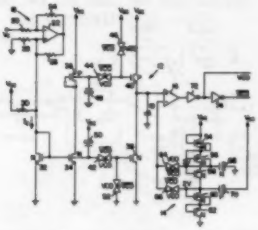
U.S. Cl. 331—111 **14 Claims**

1. A voltage controlled oscillator, comprising:

a reference capacitor which is periodically charged and discharged;

comparison means for comparing the voltage on the reference capacitor to a first reference voltage when the capacitor is charging and a second reference voltage when the capacitor is discharging, wherein the output of the comparison means is the output of the oscillator and switches from a first level to a second level when the voltage on the capacitor equals the first reference voltage and from the second level to the first level when the voltage on the capacitor equals the second reference voltage; and

pump means for charging and discharging the reference capacitor at a rate determined by the value of an input voltage, said pump means including a first MOS transistor for discharging the reference capacitor and a second complementary MOS transistor for charging the reference capacitor, third and fourth complementary MOS transistors having a current flowing through them corresponding to the value of the input voltage, switching means for alternately connecting together the gates of the



first and third transistors to turn on the first transistor and the gates of the second and fourth transistors to turn on the second transistor, and first and second capacitors connected to the gates of the third and fourth transistors, respectively, said capacitors storing a charge to facilitate rapid turn-on of the first and second transistor.

4,692,718

TUNABLE ASTABLE MULTIVIBRATOR WITH BUFFER TRANSISTORS

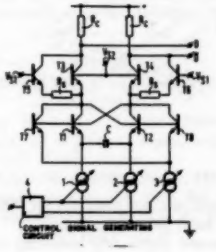
Engel Roza, and Hendrik G. Van Veenendaal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,532

Claims priority, application Netherlands, Apr. 12, 1985, 8501088

Int. Cl.⁴ H03K *3/282*

U.S. Cl. 331—113 R **6 Claims**



1. A tunable oscillator circuit provided with a pair of oscillator transistors whose bases are connected crosswise to the opposite collectors, and a capacitance which is arranged between the emitters of the oscillator transistors, each emitter being connected via an emitter current source to a reference voltage, characterized by a pair of buffer transistors in common base configuration, whose two collectors are connected via a pair of collector resistors to a supply voltage and constitute an output of the tunable oscillator circuit, said pair of buffer transistors being arranged in a cascode configuration with the pair of oscillator transistors, the emitter current of the buffer transistors being equal to the sum of the base and collector currents of the oscillator transistors.

4,692,719

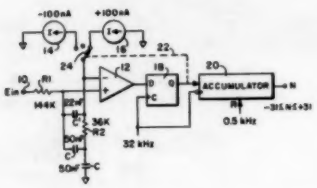
COMBINED PACEMAKER DELTA MODULATOR AND BANDPASS FILTER

Robert H. Whigham, Aurora, Colo., assignor to Telectronics N.V., Curacao, Netherlands Antilles

Filed Aug. 1, 1986, Ser. No. 891,478

Int. Cl.[4] H03K *13/22*

U.S. Cl. 332—11 D **7 Claims**



1. A combined pacemaker delta modulator and bandpass filter comprising a differential amplifier having plus and minus inputs, means for coupling an input signal to said plus input, means for connecting an RC bandpass filter network between said plus and minus inputs, and means for periodically sampling the output of said differential amplifier and, depending upon its polarity, applying a constant current of respective polarity to said minus input.

4,692,720

ARRANGEMENT FOR PRODUCING A JUNCTION BETWEEN A MICROSTRIP LINE AND A COPLANAR TRANSMISSION LINE

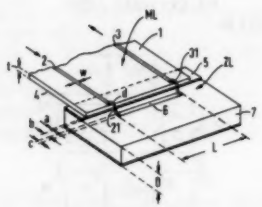
Franz Auracher, Baierbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,116

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420599

Int. Cl.[4] H01P *5/08*

U.S. Cl. 333—33 **3 Claims**



1. A broadband junction structure for a microstrip line and a coplanar twin-band line, comprising:

first and second electrically-insulating substrates each including first and second spaced apart surfaces, all of said surfaces being in respective parallel spaced apart planes;

a first ground electrode carried on said first surface of said first substrate and a second ground electrode carried on said first surface of said second substrate, said first and second ground electrodes electrically contacting one another;

first and second spaced apart parallel strip electrodes on said second surface of said first substrate which together with said first ground electrode constitute a microstrip line, said strip electrodes extending perpendicular to said second ground electrode;

at least one narrow electrode on said first surface of said second substrate spaced from said second ground electrode, said at least one narrow electrode including opposite ends and together with said second ground electrode constituting a twin-band line; and

first and second electrical connections respectively connecting said first and second strip electrodes to said opposite ends of said at least one narrow electrode.

4,692,721

DIELECTRIC ROTARY COUPLER

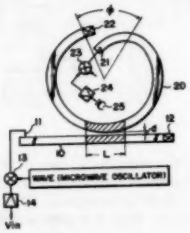
Yujiro Ito; Yasutoshi Kamatsu, and Takashi Otobe, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,726

Claims priority, application Japan, Oct. 18, 1984, 59-217371; Oct. 25, 1984, 59-223003; Apr. 25, 1985, 60-87483

Int. Cl.[4] H01P *5/08, 5/18, 3/16*

U.S. Cl. 333—109 **11 Claims**



1. In a rotary coupler for transmitting signals between signal treatment portions installed on a rotary member and a stationary member, a dielectric rotary coupler comprising a first dielectric line installed on said rotary member, a second dielectric line installed on said stationary member, a first signal input and/or output portion installed on said first dielectric line, a second input and/or output portion installed on said second dielectric line, and means for attaining a coupling between said first and second dielectric lines, one of said first and second dielectric lines being substantially ring-shaped with a center which is coincident with the axis of the rotation of said rotary member, wherein said rotary member rotates during the signal transmission between said first and second input and/or output portions.

4,692,722

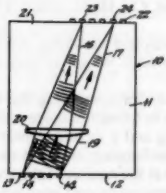
COMPACT FREQUENCY DISPERSIVE BULK ACOUSTIC WAVE CHANNELIZER

Paul Reichel, deceased, late of New York, and Gilbert Reichel, administrator, Woodbury, both of N.Y., assignors to Loral Corporation, Yonkers, N.Y.

Filed Oct. 12, 1984, Ser. No. 660,491

Int. Cl.[4] H03H *9/40*

U.S. Cl. 333—142 **1 Claim**



1. In a radio frequency bulk acoustic channelizer, including an acoustic medium of hexagonal crystalline material, having a low acoustic isotropy in at least one plane therein perpendicular to the axis of hexagonal symmetry, said medium being bounded by a plurality of opposed surfaces normal to said

plane; a frequency steered ultrasonic array disposed upon one of said surfaces, including plural beam radiating elements in mutually spaced relation, said one of said surfaces being curved whereby said radiating elements refract received beams to focus upon a second oppositely disposed surface; and an all acoustic receptor array, including plural receptor elements disposed upon said second oppositely disposed surface to receive focused beams of differing frequencies to effect channelization of said beams in accordance with given frequencies, the improvement comprising: said plural receptor elements each comprising a pair of small conducting parallel plates with a piezo electric material therebetween, said receptor elements being disposed in adjacent generally parallel relation; said receptor elements also being arranged in slanted relation relative to the direction of a received beam to result in frequency overlap in the band received by each receptor element; said receptor elements being of ovate configuration so as to favor the mid-frequencies of a received range of frequencies.

4,692,723

NARROW BANDPASS DIELECTRIC RESONATOR FILTER WITH MODE SUPPRESSION PINS

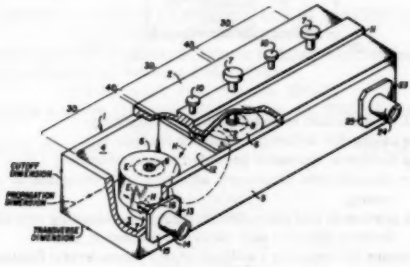
Slawomir J. Fiedziuszko, Palo Alto, and Craig A. Ziegler, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

PCT No. PCT/US85/01289, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO87/00204, PCT Pub. Date Jan. 15, 1987

PCT Filed Jul. 8, 1985, Ser. No. 758,631

Int. Cl.[4] H01P *1/20, 1/162*

U.S. Cl. 333—202 **5 Claims**



1. A narrow bandpass filter for filtering electromagnetic energy comprising dielectric resonators positioned within an elongated waveguide having a rectangular cross-section, four elongated electrically conductive walls, and wherein the dimensions of the waveguide are sufficiently small such that the electromagnetic energy would be cut off and would not propagate through the filter in the absence of the dielectric resonators; wherein:

said waveguide comprises at least two active sections each containing a dielectric resonator;

each two adjacent active sections are coupled by means comprising an electrically conductive partition which continuously abuts three of the waveguide walls and constricts the waveguide cross-section thereby forming a coupling opening for passing the electromagnetic energy between adjacent active sections;

one of a set of elongated electrically conductive mode suppression rods bisects each coupling opening, and physically and electrically connects the remaining one of the waveguide walls with the partition corresponding to said coupling opening thereby forming an electrical short circuit between a first pair of opposing waveguide walls midway between a second pair of opposing waveguide walls; and

the electromagnetic energy within the waveguide propagates in a single TE_{10} evanescent mode.

4,692,724

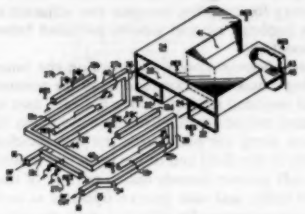
HIGH POWER TUNABLE FILTER

Mark A. Harris, Clearwater, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Oct. 21, 1985, Ser. No. 789,669

Int. Cl.[4] H01P *1/20, 1/203*

U.S. Cl. 333—202 **20 Claims**



1. A high power tunable filter, comprising:

a transmission line having an input, for receiving a signal to be filtered, and on an output, the transmission line having first and second portions and means for interconnecting the first and second portions, the first portion of the transmission line located in a first plane and the second portion of the transmission line located in a second plane substantially parallel to the first plane;

a plurality of resonators, each parallel-coupled to said transmission line and having a controllable resonant frequency;

an electronic tuning network coupled to each of said resonators for controlling the resonant frequency thereof, each such tuning network including:

one or more tunable reactive elements; and

one or more switches, each of said switches connected to one of said tunable reactive elements to enable said switch to connect the associated tunable reactive element in and out of said tuning network, thereby controlling the resonant frequency of the resonator coupled to said tuning network; and

means for driving said electronic tuning networks to set a frequency characteristic of said tunable filter.

4,692,725

DIELECTRIC FILTER HAVING TRIMMABLE CAPACITOR

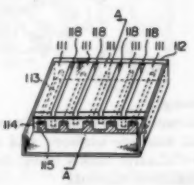
Atsushi Fukasawa; Kenichiro Hosoda; Takuro Sato, and Tatumasa Yoshida, all of Tokyo, Japan, assignors to OKI Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 490,881, May 2, 1983, Pat. No. 4,546,333. This application Jun. 26, 1985, Ser. No. 749,185

Claims priority, application Japan, May 10, 1982, 57-76565

Int. Cl.[4] H01P *1/205*

U.S. Cl. 333—203 **8 Claims**



1. A dielectric filter comprising:

(a) a conductive closed housing,

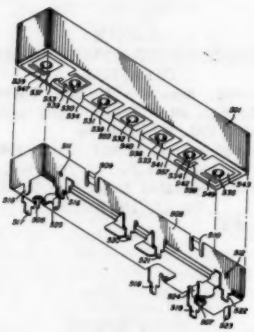
(b) at least two resonators fixed in said housing,
(c) input means for coupling one end resonator of said at least two resonators to an external circuit, and output means for coupling the other end resonator of said at least two resonators to an external circuit,
(d) each resonator comprising an elongated linear inner conductor one end of which is fixed commonly at the bottom of said housing, and the other end of which is free standing with respect to the housing and a dielectric body surrounding the inner conductors,
(e) the thickness of said dielectric body surrounding said inner conductor being sufficient to hold all the electromagnetic energy in the dielectric body except for the energy for coupling between two adjacent resonators,
(f) an unplated air gap groove provided between adjacent resonators;
(g) said dielectric body surrounding the inner conductors being a bulk body common to all the resonators in which said unplated air gap groove between two adjacent resonators extends parallel to the conductors the entire distance along the body from the free standing end of the body to the fixed end of the body and in which the depth of said groove extends only a portion of the thickness of said body, and said groove operates as said air gap between resonators for effecting static coupling between the resonators independently of magnetic coupling, and
(h) a conductive layer electrically isolated from the inner conductors and adapted to be trimmed and spaced from the end of the dielectric body which is free standing with respect to the housing, said conductive layer having a respective extended portion associated with each resonator and covering at least a portion of the end of the respective inner conductor of each resonator so that a capacitor is formed between said conductive layer and the inner conductor of each resonator wherein the respective extended portions are directly electrically coupled to each other.

4,692,726

MULTIPLE RESONATOR DIELECTRIC FILTER

Steven R. Green, Glendale Hts.; David M. De Muro, Schaumburg, and Raymond L. Sokola, Lake Zurich, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 25, 1986, Ser. No. 890,686
Int. Cl.[4] H01P *1/202, 7/04*
U.S. Cl. 333—206 **14 Claims**



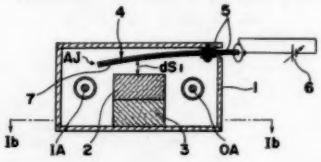
1. A filter comprising:
dielectric means comprised of a dielectric material and having first, second, and side surfaces, said second and side surfaces of the dielectric means being substantially covered with a conductive material;
at least first, second, and third holes having surfaces substantially covered by a conductive material, extending from the first surface of the dielectric means toward the second surface thereof and having openings on the first surface of the dielectric means that are disposed at predetermined distances relative to one another and substantially aligned with one another;
first and second coupling means coupled to said first and third holes, respectively;
first, second, and third capacitive means each including electrode means coupled to and surrounding the openings of first, second, and third holes, respectively, for capacitively coupling said first hole to said second hole and said second hole to said third hole and capacitively coupling said holes to the conductive material on the side surfaces of said dielectric means; and
strip electrode means coupled to the conductive coating on the side surfaces of said dielectric means and extending at least partially between two of said holes for adjusting the capacitive coupling therebetween.

4,692,727

DIELECTRIC RESONATOR DEVICE

Kikuo Wakino, Muko; Hiroshi Tamura, and Youhei Ishikawa, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 3, 1986, Ser. No. 870,088
Claims priority, application Japan, Jun. 5, 1985, 60-123136
Int. Cl.[4] H01P *7/10*
U.S. Cl. 333—219 **7 Claims**



1. A dielectric resonator device comprising:
a casing for defining a chamber therein;
a dielectric resonator provided in said chamber;
a piezoelectric frequency adjusting unit provided in said casing;
a portion of said piezoelectric frequency adjusting unit being located adjacent said dielectric resonator; and
means for applying a voltage to said piezoelectric frequency adjusting unit;
said piezoelectric frequency adjusting unit being adapted to alter its shape by the voltage applied thereto so as to control a distance between said portion and said dielectric resonator, thereby controlling the resonance frequency of said dielectric resonator device.

4,692,728

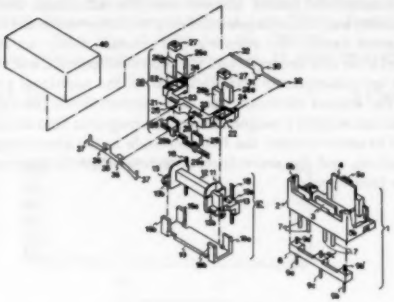
SELF-ALIGNING SPRING MECHANISM FOR AN ELECTRICAL SWITCH

Kozo Maenishi, Nagaokakyo, and Youichi Nakanishi, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation-in-part of Ser. No. 657,589, Oct. 4, 1984, Pat. No. 4,647,885. This application Sep. 26, 1985, Ser. No. 780,454
Claims priority, application Japan, Oct. 5, 1983, 58-187232
Int. Cl.[4] H01H *3/00*
U.S. Cl. 335—192 **18 Claims**

1. A movable block switch mechanism which compensates for unevenness of spring force on the movable block, comprising:
a base;
a movable block having projections; and
a sheet spring having openings which engage to the projections of the movable block and having ends which engage

to the base, and wherein deflection of at least one of the ends of the sheet spring causes the portion of the spring



between the spring openings to bulge in a direction opposite to the direction of deflection of the spring.

4,692,729

DIRECT CURRENT ELECTROMAGNET HAVING A MOVEMENT OF TRANSLATION

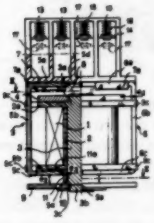
Gérard Koehler, Ville d'Avray, France, assignor to La Telemecanique Electrique, Nanterre Cedex, France

Filed Aug. 11, 1986, Ser. No. 895,487

Claims priority, application France, Aug. 16, 1985, 85 12459

Int. Cl.[4] H01F 7/08

U.S. Cl. 335—259 **10 Claims**



1. A direct current electromagnet having a movement of translation, comprising a first magnetic assembly (3, 4) and a second magnetic assembly (5, 6), said assemblies being movable with respect to one another, and a winding (1) wound on a coil former (2) surrounding a core (3) which belongs to the first assembly and one end (3*a*) of which is provided with a pole shoe (4) facing a first zone (5*a*, 6*a*) of the second assembly (5), thus defining a first large-surface air-gap (4/5*a*, 6*a*), characterised in that the second end (3*b*) of the core (3) is continued beyond the coil former (2) and is provided with a second pole shoe (9), and the second magnetic assembly (5, 6) has a second zone (5*c*, 6*c*) disposed between the coil former (2) and the second pole shoe (9), thus defining with the latter (9) a second large-surface air-gap (9/5*c*, 6*c*) disposed magnetically in series with the first air-gap (4/5*a*, 6*a*) and closing simultaneously therewith.

4,692,730

ELECTROMAGNETIC RELAY HAVING AN INSULATING CAP AND A METHOD FOR MANUFACTURING THE INSULATING CAP

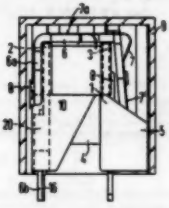
Erwin Müller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 827,502

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506354

Int. Cl.[4] H01F 5/06

U.S. Cl. 335—278 **3 Claims**



1. In an electromagnetic relay of the type in which a coil body carrying a winding having an axis, in which the coil body comprises end flanges perpendicular to the axis, and in which an insulating cap surrounds at least that portion of the coil body and winding lying above a plane extending through the axis, the improvement comprising:

a central section of the insulating cap shaped complementary to the outer contour of and receiving the winding therein;

a pair of pockets perpendicular to the axis and connected to said central section and receiving respective ones of the flanges;

a yoke including a first leg extending parallel to the axis adjacent and external of the insulating cap and a second leg extending perpendicular to the axis adjacent one of the pockets and external of the insulating cap; and

an axially extending core projecting out of each end of the coil body, the insulating cap comprising means defining clearances for receiving the projecting ends of the core.

4,692,731

COMPOSITE WIRE, COIL AND DEFLECTION UNIT FOR HF APPLICATIONS

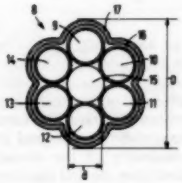
Halbe Osinga, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1986, Ser. No. 847,988

Claims priority, application Netherlands, Apr. 4, 1985, 8500993; Feb. 12, 1986, 8600341

Int. Cl.[4] H01F 5/00

U.S. Cl. 335—299 **13 Claims**



1. A composite wire for high-frequency applications, comprising: at least one bare wire strand and a plurality of single wire strands of electrically conductive material; each of the single wire strands having a thin insulating layer and extending

in pre-determined parallel positions with respect to each other and parallel to the length of the composite wire; all of said wire strands being bundled to form a solid assembly; and a layer of electrically insulating material enveloping such solid assembly.

4,692,732

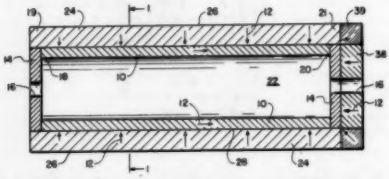
REMANENCE VARYING IN A LEAKAGE FREE PERMANENT MAGNET FIELD SOURCE

Herbert A. Leupold, Eatontown; Ernest Potenziani, II, Ocean, and John Clarke, Cranford, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 30, 1986, Ser. No. 868,862

Int. Cl.[4] H01F *7/02*

U.S. Cl. 335—302 **14 Claims**



1. A magnetic circuit having low magnetic leakage comprising:

a constant radial thickness, remanence varying axially magnetized cylindrical magnet having an axial bore therethrough with a longitudinally linearly increasing magnetic field therein; and

a constant radial thickness, remanence varying radially magnetized cladding magnet coaxially circumscribing said cylindrical magnet.

4,692,733

FUSE FOR AN ALTERNATING CURRENT POWER CIRCUIT

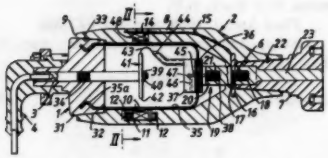
Martin C. Oakes, Leeds, England, assignor to Y. S. Securities Limited, West Yorkshire, England

Filed Jul. 17, 1986, Ser. No. 887,547

Claims priority, application United Kingdom, Jul. 20, 1985, 8518381

Int. Cl.[4] H01H *85/04*

U.S. Cl. 337—158 **25 Claims**



1. A fuse for an alternating current power circuit in the voltage range of 3.3 kV to 38 kV, the fuse comprising a sealed chamber; a first electrode mounted within the chamber, the first electrode having a substantially circular periphery and being electrically connected to a first terminal to which a first conductor may be connected; a second electrode with a conductive surface internally of the chamber, the conductive surface being spaced from the first electrode; a second terminal to which a second conductor may be connected; a coil connected in an electrical path between the second electrode and the second terminal; an additional electrical contact mounted within the chamber and in direct electrical connection with the second terminal; a fusible element directly electrically connected between the first electrode and the additional electrical contact, and an electronegative halogenated medium filling free space within the chamber; the normal current path between the first and second terminals being by way of the first electrode, the fusible element and the additional electrical contact; and the arrangement being such that when the fusible element breaks, the resulting fault current forms an arc between the first electrode and the additional contact, one root of the arc subsequently commutates from the additional contact to the second electrode, the fault current flows through the coil and induces a magnetic field, the magnetic field causes the arc to rotate around the first electrode in the electronegative medium, and the arc is thereby extinguished, so interrupting the fault current.

4,692,734

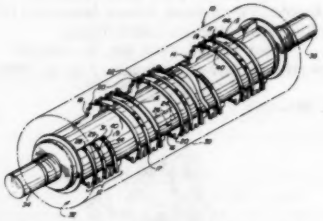
INTERRUPTING DEVICE WITH IMPROVED CURRENT-LIMITING ARRANGEMENT

Roy T. Swanson, Riverside; Leonard V. Chabala, Maywood, and Hiram S. Jackson, Glenview, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Jul. 21, 1986, Ser. No. 888,560

Int. Cl.[4] H01H *85/04, 85/12*

U.S. Cl. 337—162 **20 Claims**



1. A current-limiting arrangement for an interrupting device that includes a main current path in parallel with the current-limiting arrangement, the main current path including a switch which is operable to rapidly open the main current path, the current-limiting arrangement comprising:

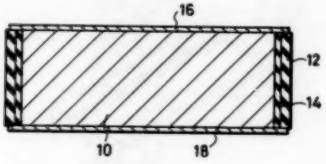
means comprising a plurality of fusible elements for improving the transfer of high currents from the main current path to the current-limiting arrangement without substantially increasing the minimum current that is interruptable by the current-limiting arrangement, each of said plurality of fusible elements comprising an elongated, thin, conductive ribbon, one or more of said plurality of fusible elements having holes, slots, or notches formed through or in said ribbon and spaced along the length of said ribbon with the length of each of said holes, slots, or notches not exceeding a first predetermined dimension along the length of said ribbon, the remaining one or more of said plurality of fusible elements having holes, slots, or notches formed through or in said ribbon and spaced along the length of said ribbon with the length of each of said holes, slots, or notches being greater than or equal to a second predetermined dimension along the length of said ribbon, said second predetermined dimension being greater than said first predetermined dimension.

4,692,735

NONLINEAR VOLTAGE DEPENDENT RESISTOR AND METHOD FOR MANUFACTURING THEREOF

Moritaka Shoji; Takeo Yamazaki, and Satoru Ogihara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,584
Claims priority, application Japan, Apr. 25, 1984, 59-81831
Int. Cl.[4] H01C 7/10
U.S. Cl. 338—21 5 Claims



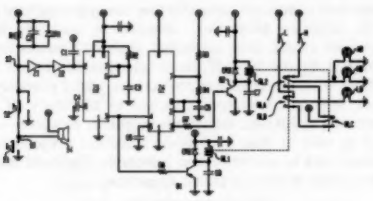
1. A nonlinear voltage dependent resistor comprising a zinc oxide (ZnO) based sintered body constituting a current flowing passage having high-resistance layer formed on the side thereof and electrodes (18) formed on the upper and lower ends thereof characterized in that said high-resistance side layer contains silicon, antimony, bismuth, and lithium, the average composition of the portion from the side surface to a depth of 200 μm being 5 to 70 mol % of silicon (in terms of SiO_2), 2 to 30 mol % of antimony (in terms of Sb_2O_3), 2 to 10 mol % of bismuth (in terms of Bi_2O_3), 0.01 to 5 mol % of lithium (in terms of Li_2CO_3), and 10 to 90 mol % of zinc (in terms of ZnO).

4,692,736

VEHICLE FLASHER

Victor Crisci, 70 Lenox Rd., Wayne, N.J. 07470

Filed Apr. 17, 1985, Ser. No. 724,455
Int. Cl.[4] B60Q 1/46
U.S. Cl. 340—81 R 15 Claims



1. A flasher for flashing a vehicle light normally powered by a power switch, comprising:

a manual switch;

an interval means coupled to said manual switch for providing in response to its operation a duration signal of at least a predetermined duration;

cycling means coupled to said interval means for providing a periodic cycling signal in response to and for the duration of said duration signal, said predetermined duration of said duration signal exceeding the period of said periodic cycling signal;

pulsing means for providing a power output, said pulsing means being coupled to said cycling means for blanking said power output in response to and synchronously with said cycling signal; and

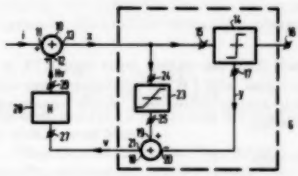
substitution means coupled to said power switch, said interval means and said pulsing means for repowering said light from said pulsing means instead of said power switch in response to and for the duration of said duration signal, said substitution means being operable by said interval means in the absence of said periodic signal from said cycling means to power said vehicle light for said predetermined duration, whereby said vehicle light is flashed for said predetermined duration.

4,692,737

ENCODING DEVICE

Eduard F. Stikvoort; Arthur H. M. van Roermund, and Peter J. A. Naus, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1986, Ser. No. 920,490
Claims priority, application Netherlands, Apr. 4, 1986, 8600862
Int. Cl.[4] H03M 1/00
U.S. Cl. 340—347 DD 14 Claims



1. An encoding device comprising a quantizer for converting an input signal into an one-bit encoded signal, which quantizer comprises an input for receiving the input signal and an output for supplying the one-bit encoded signal, and further comprising error-feedback means for feeding back to the quantizer input a quantization-error signal caused by the quantizer, which error-feedback means comprise an at least third-order filter having an input and an output, wherein the transfer function of the filter is given by

$$H_n(Z)=1-(Z-b)^n/(Z-a)^n$$

where:

$n \geqq 3$ is the order of the filter

b is a constant substantially equal to unity, and

a is a constant for which $0<a<b$,

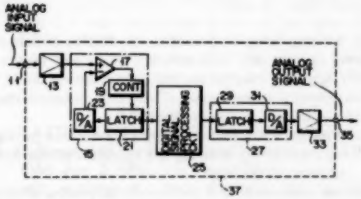
and in that the device comprises limiting means for limiting the quantization-error signal applied to the input of the filter.

4,692,738

ANALOG SIGNAL PROCESSING APPARATUS

Seigo Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 13, 1985, Ser. No. 711,382
Claims priority, application Japan, Mar. 14, 1984, 59-48606
Int. Cl.[4] G06G 7/12; G06J 1/00; H03K 13/02
U.S. Cl. 340—347 C 9 Claims



1. An analog signal processing apparatus comprising:

analog-to-digital converting means for receiving an analog input signal and converting said analog signal to a digital signal in accordance with a predetermined converting function and outputting the digital signal;

digital signal processing means connected to said analog-to-

digital converting means for receiving the output digital signal of said analog-to-digital converting means and performing a predetermined digital signal process upon the output digital signal of said analog-to-digital converting means; and

digital-to-analog converting means, connected to said digital signal processing means and separate from said analog-to-digital converting means, for receiving and converting the output digital signal of said digital processing means to an output analog signal in accordance with a converting function which is substantially equal to the inverse function of said converting function of said analog-to-digital converting means;

said analog-to-digital converting means represented by the relationship:

$$D_I = f(A_I)$$

in which A_I is the analog input signal, D_I is the digital output signal, and f is the converting function; and said digital-to-analog converting means represented by the relationship:

$$Aj = f^{-1}(D_j)$$

in which D_j is the output digital signal of the digital signal processing means, Aj is the output analog signal, and f^{-1} is the converting function substantially equal to the inverse of the converting function f; thereby correcting error occuring when said analog-to-digital converting means converts the input analog signal to the digital signal.

4,692,739

CONTROL DEVICE USING LIGHT-EMITTING DIODES FOR BOTH MANUAL INPUT AND DISPLAY OF DATA

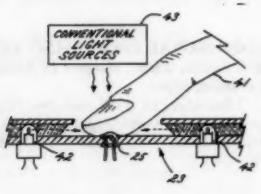
Alfred Dorn, Rodgau, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 750,673

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424412

Int. Cl.[4] G08C *21/00*

U.S. Cl. 340—365 P **17 Claims**



1. An apparatus for the input and display of data of the kind having at least one light-emitting diode and means for selectively applying current to said light-emitting diode to display to an operator at least some of said data, wherein the improvement comprises, in combination,

said means for selectively applying current provides means for repetitively limiting the applied current to said light-emitting diode, and

means responsive to a photo-current produced by said light-emitting diode in response to surrounding illumination for generating at least some of said data when said means for selectively applying current repetitively limits said applied current so that said light-emitting diode functions both as a data display device and as a data input device responsive to the covering of said light-emitting diode by said operator.

4,692,740

KEY INPUT DEVICE

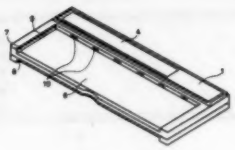
Isamu Washizuka, Kyoto, and Kiyoshi Kinugawa, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1984, Ser. No. 581,799

Claims priority, application Japan, Feb. 21, 1983, 58-24563[U]

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—365 R **8 Claims**



1. A key input device for an electronic apparatus that has a body, comprising:

selectable keyboard means for producing key input signals, said selectable keyboard means including a plurality of key switches; and

connector means for connecting said selectable keyboard means to the body of the electronic apparatus so that said key input signals can be input to the electronic apparatus, said connector means providing a non-fixed connection of said selectable keyboard means and the body of the electronic apparatus so that said selectable keyboard means and the body of the electronic apparatus are disconnectable without damage to said connector means,

wherein said connector means comprises a plurality of lock projections provided on said selectable keyboard means and a plurality of locks provided on the body of the electronic apparatus for engaging said plurality of lock projections, and

wherein said connector means further comprises at least one mode selection projection, attached to said selectable keyboard means, said selectable keyboard means being identified by the type of mode selection projection and number of mode selection projections, and a plurality of mode selection receptors attached to the body of the electronic apparatus, said mode selection receptors coupled to said at least one mode selection projection to connect and to indentify said selectable keyboard means to the body of the electronic apparatus.

4,692,741

MOTOR ACTUATED BUZZER ASSEMBLY WITH A PLURALITY OF LEAF SPRINGS OF DIFFERENT FREQUENCIES

Shigeo Shimoya, Kitamoto; Yutaka Iwasaki, Kumagaya; Tadashi Ishii, Tokyo, and Hikoji Iwasaki, Konosu, all of Japan, assignors to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,219

Claims priority, application Japan, Jun. 29, 1984, 59-98357[U]; Jul. 14, 1984, 59-10568[U]

Int. Cl.[4] G10K *1/00, 1/08*

U.S. Cl. 340—392 **6 Claims**

1. A motor actuated buzzer comprising:

(a) a body;

(b) a motor mounted on said body and having a rotatable output shaft;

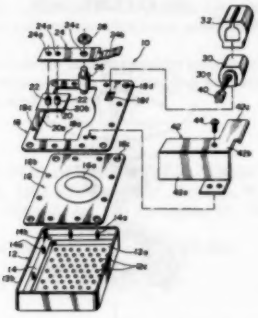
(c) cam means comprising at least one cam member fixedly mounted on said output shaft and having a plurality of radial protrusions;

(d) a sound generating plate mounted on said body;

(e) a hammer for striking said sound generating plate; and

(f) resilient means comprising a plurality of leaf springs

placed one upon the other, each of said springs being fixed to said body at one end thereof and urged toward said cam member, one of said leaf springs carrying said hammer intermediate opposite ends thereof and having at a free end thereof a projection, said radial protrusions being engageable with said projection upon rotation of said cam



member, said plurality of leaf springs having such different frequencies that, when said cam member rotates, said plurality of leaf springs cooperate with one another to oscillate as a combined leaf spring which is wider in bandwidth than any one of said plurality of leaf springs, whereby said sound generating plate is intermittently struck by said hammer to produce a buzzing sound.

4,692,742

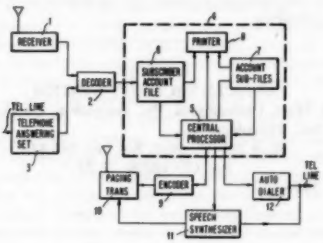
SECURITY SYSTEM WITH CORRELATED SIGNALLING TO SELECTED SATELLITE STATIONS

David T. Raizen, 31 Meadow Rd., Scarsdale, N.Y. 10583, and Richard A. Wilmot, 9 Woodlawn Ave., Albany, N.Y. 12209

Filed Oct. 21, 1985, Ser. No. 789,568

Int. Cl.[4] G08B *1/08*; H04Q *7/00*

U.S. Cl. 340—539 **9 Claims**



1. A security system comprising:

a plurality of sensors respectively adapted to produce an alarm signal upon occurrence of a predetermined alarm condition at a location monitored by such sensor;

a plurality of encoders respectively connected to said sensors, each encoder being responsive to the alarm signal produced by the sensor connected thereto to encode such alarm signal to identify the corresponding alarm condition and sensor location;

means connected to each of said encoders for transmitting the encoded alarm signals produced thereby over at least one transmission channel;

a plurality of satellite stations respectively adapted to receive correlated signals which uniquely address each of such satellite stations;

a central control station comprising means for receiving and decoding the transmitted encoded alarm signals from said transmission channels;

a computer further comprised in said central control station programmed to correlate each of the decoded alarm signals with information stored in the computer memory relating to each sensor location and alarm condition, and adapted to produce correlated signals which respectively address one or a plurality of particular satellite station to be notified of respective alarm conditions and include the correlated signals to be transmitted to each such satellite station and further adapted to select the number and identities of the satellite stations to be notified, which selection being a function of the nature of the alarm condition and of the location being monitored by said sensor;

and means comprised in said central control station and connected to said computer for transmitting such correlated signals to the satellite stations identified thereby.

4,692,743

ALARM SYSTEM

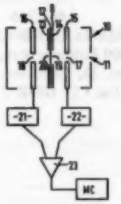
Harold C. Holden, and June Holden, both of Glen Dhoo Cottage Ballaugh Glen, Isle of Man

Filed Oct. 15, 1985, Ser. No. 787,404

Claims priority, application United Kingdom, Apr. 6, 1984, 8408937

Int. Cl.[4] G08B *13/20*

U.S. Cl. 340—544 **6 Claims**



1. An alarm system comprising a sensor responsive to air pressure within an enclosed space, the sensor providing electrical signals as a function of the sensed air pressure, and a signal processor to which the electrical signals are supplied and operative to initiate an alarm indication when the signal supplied by the sensor is indicative of an intrusion into the enclosed space, said alarm system being characterized in that the signal processor is operative to cause the sensor to measure the air pressure in the enclosed space at intervals and to compare the measured value with a plurality of predetermined discrete narrow reference ranges of values and select the reference range within which the measured value lies, and also to cause the sensor to measure the air pressure in the enclosed space at other more frequent intervals and compare the measured value with the reference range selected at that time, an alarm indication being given if a value measured at one of the more frequent intervals lies outside the reference range selected at that time.

4,692,744

GLAZING UNIT ALARM SYSTEMS

James A. A. Hickman, 14a Seaforth Drive, Edinburgh, Scotland

Filed Jan. 2, 1986, Ser. No. 815,586

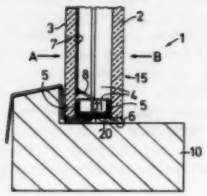
Claims priority, application United Kingdom, Jan. 4, 1985, 8500203

Int. Cl.[4] G08B *13/00*

U.S. Cl. 340—550 **12 Claims**

1. A glazing unit alarm system comprising a glazing panel and electric alarm means including a light transmitting electrically conductive coating extending over at least most of the area of the glazing panel and detection means for detecting a

change in resistance of the electrically conductive coating occasioned by a breakage or an attempted breakage of the glazing panel, wherein the electrically conductive coating comprises an emissivity coating which reflects the majority of incident heat radiation having wavelengths in a first wavelength band and which transmits the majority of incident heat



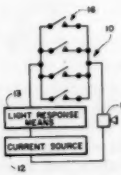
radiation having wavelengths in a second wavelength band, the first and second wavelength bands being non-overlapping and each lying in the infra-red region of the electromagnetic spectrum, one of the wavelength bands containing shorter wavelength solar heat radiation and the other wavelength band containing longer wavelength room heat radiation.

4,692,745

CREDIT CARD ALARM

Solly Simanowitz, 6009 Bellevue Ave., La Jolla, Calif. 92037

Filed Dec. 23, 1985, Ser. No. 812,520
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—568 **7 Claims**



1. In a foldable wallet having two inner portions which fold together when said wallet is not in use and are unfolded when said wallet is in use, an alarm system for one of said portions comprising a credit card holder having a plurality of receptacles for receiving and maintaining credit cards, said alarm system comprising:

a plurality of switches, one of which is associated with each of said plurality of receptacles, said switches being switched to an open state when an object is received therein and being switched to a closed state when the object is removed therefrom;

a photoconductive means positioned in the inner portion of said foldable wallet, which inhibits current flow when exposed to light energy when the wallet unfolded and conducts current in the absence of light energy when the container is folded for non-use,

a current source;

an audio alarm;

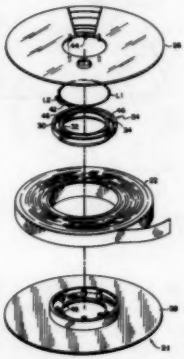
said plurality of switches, photoconductive means, current source and audio alarm being operatively interconnected so as to sound the audio alarm only when one or more of said plurality of switches are closed, by a removed credit card, and said wallet is in a folded non-use position wherein said photoconductive means receives no light energy.

4,692,746

RECORDING-TAPE-REEL ASSEMBLY WITH ELECTRONIC TAG

Richard J. Budin, Clearwater; James G. Wyatt, Jr., Treasure Island, and Fred W. Herman, Tampa, all of Fla., assignors to Security Tag Systems, Inc., St. Petersburg, Fla.

Filed Feb. 26, 1986, Ser. No. 833,824
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—572 **5 Claims**



1. A recording-tape-reel assembly, comprising

a reel for holding a recording tape;

an electronic tag for enabling detection of the presence of the assembly in a presence detection system; and

means for housing the electronic tag in the assembly so that the electronic tag is isolated from said tape and is inaccessible to users of the assembly;

wherein the reel comprises a hub on which said tape is wound and flanges attached on opposite sides of the hub;

wherein one exterior side of the hub defines a slot;

wherein the tag is disposed in said slot; and

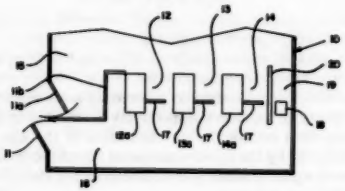
wherein one of the flanges covers the slot to isolate the tag from said tape and to make the tag inaccessible to users of the assembly.

4,692,747

ARTICLE SECURITY SYSTEM

Albert E. Wolf, Philadelphia, Pa., assignor to Checkpoint Systems, Inc., Thorofare, N.J.

Filed Jul. 17, 1986, Ser. No. 886,418
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—572 **10 Claims**



1. In a check-out system for premises having an interior area which houses articles protected against unauthorized removal from said premises, said articles having affixed thereto security tags which are detectable by an electronic article surveillance system, said premises being provided with a plurality of check-out aisles for said articles, each aisle having one end facing said interior area and an opposite end facing a common passageway

connecting all of said opposite ends to each other and to an exit from said premises, the improvement which comprises:

means for barring persons desiring to remove articles from said premises via said check-out aisles from accompanying said articles through said aisles to their said opposite ends;

at least one path separate from said check-out aisles and leading from said interior area to said common passageway, through which path said persons are able to reach said opposite ends of the check-out aisles for article retrieval; and

an electronic article surveillance system associated with said at least one separate path for detecting security tags carried through said separate path.

4,692,748

APPARATUS FOR DETERRING THUMBSUCKING

George F. Pinsak, 1102 E. Franklin St., Monroe, N.C. 28110, and Henry H. Morton, Jr., 100 Covington St., Wadesboro, N.C. 28170

Filed Jul. 18, 1986, Ser. No. 887,863

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—573 **10 Claims**

5. Glove apparatus for deterring a person from thumbsucking, said glove apparatus comprising a glove body adapted to be worn on the person's hand, a first electrical contact affixed to said glove body for electrical contact with the person's skin, a second electrical contact affixed to said glove body for exposure outwardly of the person's thumb in electrically insulated relation therefrom, circuit means electrically connecting said first and second electrical contacts for potential electrical current flow therebetween, battery means attached to said glove body in electrical association with said circuit means for supplying electrical current thereto, and alarm means attached to said glove body in electrical association with said circuit means for activation of an audible signal by electrical current flow through said circuit means, said first and second electrical contacts being adapted to complete a continuous electrical circuit through said circuit means and through the body of the person when the thumb is inserted in the person's mouth in electrical contact therewith for permitting flow of electrical current from said battery means through said circuit means to activate said alarm means to alert the person to remove the thumb from the mouth.

4,692,749

WEARABLE ALARM

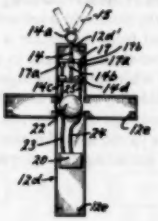
Wilfred C. Bussing, Jr., 2905 Bayard Park Dr., Evansville, Ind. 47714

Filed Aug. 29, 1985, Ser. No. 770,597

Int. Cl.[4] G08B *13/00*

U.S. Cl. 340—574 **4 Claims**

1. A wearable alarm comprising a first portion positioned on the person of a user, a second portion slidable on said first portion, where said first portion includes first electrical contact means, and where said second portion includes second electrical contact means slectively engaging said first electrical contact means, and signaling means on said second portion responsive to said selective engagement of said second electrical contact means with said first electrical contact means, where said first portion and said second portion are disposed within a housing, where said second portion slides on a stem on said first portion, where said stem includes a bulbous portion,



and where said bulbous portion engages a portion of said housing when said second electrical contact means selectively engages said first electrical contact means.

4,692,750

FIRE ALARM SYSTEM

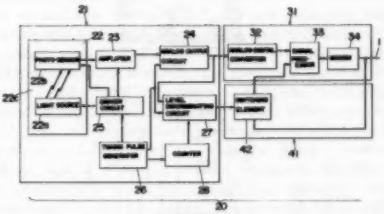
Kazumasa Murakami, and Motoharu Terada, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,786

Claims priority, application Japan, Mar. 31, 1986, 61-74654; Mar. 31, 1986, 61-74655

Int. Cl.[4] G08B *17/00, 23/00*

U.S. Cl. 340—588 **11 Claims**



1. In a fire alarm system comprising a receiver in combination with fire detecting terminal means connected thereto through a common signal transmission line comprising two wires,

said fire detecting terminal means including:

a sensor for sensing a fire-indicative parameter such as a smoke density to be measured and producing an analog signal representative thereof;

a level-signal output section for transmitting a level signal to the receiver, said level-signal output section including level-shifting means connected between the wires of the transmission line so as to cause the level-shifting of the level signal when the sensed parameter has a level higher than a predetermined threshold level;

an analog-digital converter converting the analog signal from the sensor into a corresponding digital signal;

a binary information transmission section for transmitting the digital signal in the form of a superimposed signal upon the level signal,

the level signal and the digital signal being transmitted in a time-division multiplexing manner over the transmission line; and

said receiver including:

first means responsive to the level-shifting of the level signal for determining fire presence;

second means responsive to the digital signal transmitted

from the analog-digital converter for determining fire presence based thereon independently of the first means; the improvement comprising:

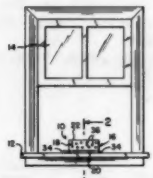
said fire detecting terminal means including: comparator means connected to the level-shifting means, said comparator means has the threshold level with which the value of the analog signal from the sensor is compared so that it actuates the level-shifting means to make the shifting of the level signal when the analog signal has a level higher than the threshold level, and said threshold level being selected independently of a criterion utilized in determining fire presence by the second means receiving the superimposed signal including the information of the sensed parameter.

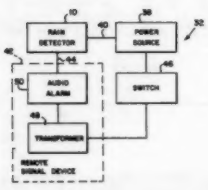
4,692,751

RAIN DETECTOR

Gain Upton, R.R. 1, Box 61, Flora, Ind. 46929, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Sep. 2, 1986, Ser. No. 902,771
Int. Cl.[4] H01H *35/00*; G08B *21/00*
U.S. Cl. 340—602 **4 Claims**





1. A rain detector to be placed on a sill of an open window, said detector comprising:

(a) an insulated housing having a plurality of upright walls forming a walled enclosure, a bottom wall and an open top;

(b) a first contact member mounted to said bottom wall within said housing;

(c) a pair of springs mounted vertically to said bottom wall within said housing at opposite sides of said first contact member;

(d) an insulated plate mounted on said springs so as to vibrate within the cavity defined by said upright walls of said housing;

(e) a second contact member mounted to underside of said plate and being spaced apart from said first contact member; and

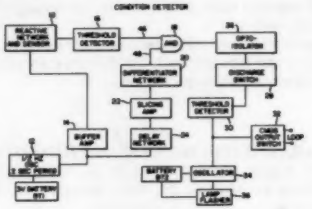
(f) an alarm circuit electrically connected to said first and second contact members so that rain drops falling on said plate will cause said plate adjacent to said open top to vibrate up and down within the cavity defined by said upright walls of said housing allowing said first and second contact members to momentarily touch each other producing a pulsating action through said alarm circuit.

4,692,752

MOISTURE DETECTOR

William E. Abel, Portland, Oreg., assignor to Sentrol, Inc., Portland, Oreg.

Filed Aug. 27, 1984, Ser. No. 644,553
Int. Cl.[4] G08B *29/00*
U.S. Cl. 340—604 **8 Claims**



1. A moisture detector detecting the presence of moisture in a region to be tested comprising:

(a) a pair of electrically conductive members disposed within said region;

(b) a reactive network including said pair of electrically conductive members;

(c) oscillator means for producing an alternating current signal having a predetermined period, said signal being coupled to said reactive network;

(d) threshold detection means responsive to said reactive network for providing a periodic output signal as long as the conductivity between said electrically codnuctive members stays below a predetermined level;

(e) pulse circuit means connected to said oscillator means for developing a delayed sampling pulse from the output of said oscillator means;

(f) gate means responsive to both an output of said threshold detection means and said delayed sampling pulse for producing a periodic maintenance pulse;

(g) electrically isolating means responsive to said periodic enabling signal for generating an alarm control signal; and

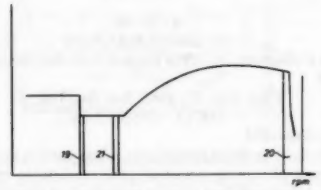
(h) alarm means responsive to said alarm control signal for remaining in a non-alarm state when the moisture level within said region remains below a predetermined threshold but switching to an alarm state after a predetermined time period in the absence of said alarm control signal.

4,692,753

IGNITION SYSTEM WITH AN R.P.M. INDICATOR

Bo C. Andreasson, Göteborg, and Bo R. Rangert, Mölnlycke, both of Sweden, assignors to AB Electrolux, Stockholm, Sweden

Filed Nov. 23, 1984, Ser. No. 674,071
Claims priority, application Sweden, Nov. 24, 1983, 8306487
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—671 **11 Claims**



1. In an internal combustion engine system having a carburetor adjustable to control an r.p.m. of the engine, means for providing a signal corresponding to the r.p.m. of said engine, and ignition control means responsive to said signal for con-

trolling the ignition of said engine; the improvement comprising an indicator, and means responsive to said signal for energizing said indicator to provide a substantially constant indication in an idle range of r.p.m. of the engine while de-energizing said indicator at r.p.m. immediately above and below said idle range, said responsive means being further responsive to energize said indicator to provide a substantially constant indication in a range of predetermined race r.p.m. of said engine corresponding to the highest allowable r.p.m. range of said engine.

4,692,754

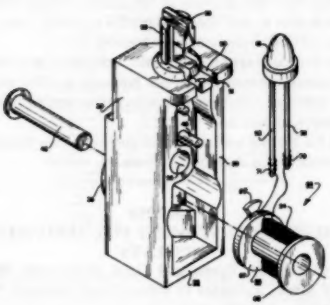
ROTATION INDICATING DEVICE

Merardo P. Edejer, Westlake; Roger S. Ford; John J. Jailor, both of North Ridgeville, all of Ohio, and Michael J. Jens, Burns, Tenn., assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed May 30, 1986, Ser. No. 868,956

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—671 **16 Claims**



1. A rotation indicating device for use in a machine having a rotating magnet on a rotating member in a casing;

said rotation indicating device comprising, in combination:

a housing having a longitudinal wall, a first end wall through which a longitudinal axis extends and an open side;

longitudinal locator means on said first end wall generally along said longitudinal axis;

a longitudinally facing locator shoulder on said housing adapted to be complementary to a shoulder on the machine casing;

a preassembled subassembly of a flexible wire coil and an indicator lamp having two leads;

means connecting said lamp leads to the ends of the flexible wire coil;

the flexibility of said wire ends establishing said coil and said indicator lamp subassembly as having a variable length;

a magnetically permeable core for said coil;

said subassembly being inserted in said housing through said open side with said wire coil received on said core and said lamp received on said longitudinal locator means; and

means to fix said coil in said housing and fix said indicator lamp on said longitudinal locator means to establish a predetermined length of the entire rotation indicating device whereby said lamp is adapted to be positioned at an aperture in the machine casing upon said locator shoulder engaging the shoulder in the machine casing.

4,692,755

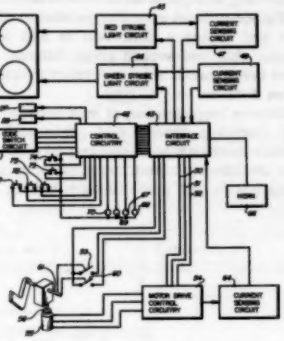
LOADING DOCK SIGNAL AND CONTROL SYSTEM

Norbert Hahn, South Milwaukee, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Feb. 22, 1985, Ser. No. 704,430

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—687 **8 Claims**



1. A signalling and control system for a dock facility including a loading dock and a releasable locking device operative to retain a parked vehicle at the dock, said locking device including a locking member having a lower unlocked position and an upper locked position in which it is lockingly engageable with a safety bar of a parked vehicle to hold the parked vehicle against the dock during loading and unloading of the vehicle, and electrically controllable reversible actuating means for moving said locking device between said unlocked and locked positions, said reversible drive means including drive means and a slip coupling between said drive means and said locking member said system comprising: outside and inside signal light means positioned and energizable to give vehicle operators and dock personnel clearly visible indications of when it is safe and unsafe to park or remove a vehicle and when it is safe to load and/or unload a parked vehicle, manually operable switch means accessible to dock personnel, and operating means coupled to said signal light means, to said switch means and to said actuating means for controlling said actuating means from said switch means and for energizing said signal light means in accordance with the condition of said locking device, said operating means being operative in response to actuation of said switch means to a lock condition to operate said drive means in a locking direction for a time interval of predetermined duration sufficient to normally effect upward movement of said locking member from said lower unlocked position and at least to said upper locked position, said operating means being operative in a slippage control mode for energizing said drive means to effect upward return movement of said lock member toward said locked position following downward slipping movement of said member from said locked position to a position intermediate said locked and unlocked positions.

4,692,756

DEVICE FOR GENERATING A 2-AXIS CONTROL SIGNAL

David G. Clark, Redhill, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,012

Claims priority, application United Kingdom, Jul. 4, 1983, 8318103

Int. Cl.[4] G09G *1/00*

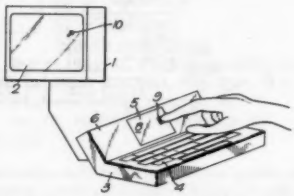
U.S. Cl. 340—709 **16 Claims**

1. A manually operable signal generating device for generating two-axis control signals, comprising

an element defining a substantially planar window area, said window having a length in a first direction at least equal to a first given distance, and a width in a second direction, orthogonal to said first direction, at least equal to a second given distance,

mounting means defining an axis parallel to said second direction, and having two guide surfaces and means for supporting said guide surfaces with respect to each other, said guide surfaces extending parallel to said second direction and having a dimension in said second direction greater than said second given distance, said guide surfaces being spaced apart a distance greater than said first given distance,

a continuous loop member, at least parts of which are flexible, extending around said guide surfaces in slidable contact therewith, and between said guide surfaces in said first direction, at least those parts of said member in contact with said guide surfaces having a width in said



second direction such that the ratio of such width to said distance by which the guide surfaces are spaced apart is sufficient to resist skewing about said guide surfaces, and said means for supporting further supporting said guide surfaces with respect to said element such that said window area is adjacent said loop member between said guide surfaces,

an actuating part fixed at a location on said loop member, adjacent to and accessible through said window area, and movable by finger pressure to any position within said window area, movement of the actuating part in the second direction thereby sliding the entire loop member in the second direction; and movement of the actuating part in the first direction thereby causing said loop member to rotate about said axis and slide over said guide surfaces, and

signal means responsive to movement in at least one of said directions for generating control signals representative of said movements.

4,692,757

MULTIMEDIA DISPLAY SYSTEM

Susumu Tsuhara, Sagamihara; Kuniaki Tabata, Tokyo, and Yasuyuki Okada, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,496

Claims priority, application Japan, Dec. 24, 1982, 57-226120

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—721 **4 Claims**

1. A system for displaying at least one specified partial region of a page of a document information, comprising:

display means having a screen for displaying a frame of information;

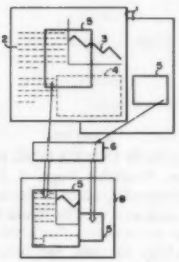
file means for storing therein a plurality of pages of document information, including character information and picture image information, said character information containing coded data, while said picture image information contains dot data;

first memory means for temporarily storing therein a page of document information including character information and picture image information read out from said file means;

second memory means for storing therein a frame of information in the form of dot patterns to be supplied to said display means for display on said screen;

means for specifying at least one page of said document information stored in said file means and at least one partial region of said specified page of said document information;

controlling means responsive to said specifying means for reading out said specified page of said document information from said file means, for storing the read-out page of document information in said first memory means and for



extracting therefrom that portion of the character information and that portion of the picture image information which exist in said specified partial region of said specified page of said document information;

means for converting only said extracted portion of the character information to dot patterns and for storing the dot patterns obtained by said conversion in said second memory means; and

means for storing said extracted portion of the picture image information in said second memory means.

4,692,758

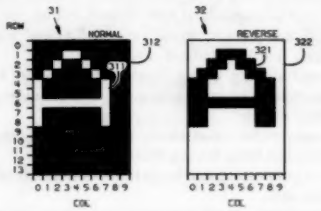
LEGIBILITY ENHANCEMENT FOR ALPHANUMERIC DISPLAYS

Bradley W. Fawcett, Byron, and Lee A. Sendelbach, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,770

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—735 **6 Claims**



1. Apparatus for enhancing the legibility of character images of a display for alphanumeric character images made up of a matrix of individual dots having character generating means for producing a video signal having first and second levels, and having attribute means for producing an attribute signal specifying a display attribute having first and second modes, the improvement comprising:

first generator means in said character generator means for producing a first font of character shapes;

second generator means in said character generator means for producing a second font of character shapes, said

second font having substantially the same overall size as said first font and being complementary thereto; and,

logic means resopnsive to said attribute signal for producing said video signal from said first font of character shapes when said atrribute signal is said first mode and for producing said video signal from said second font of characteer shapes when said attribute signal is in said second mode.

4,692,759

APPARATUS FOR MODIFYING THE APPEARANCE OF THE POINTS OF AN IMAGE ON THE SCREEN OF A GRAPHIC IMAGE DISPLAY CONSOLE

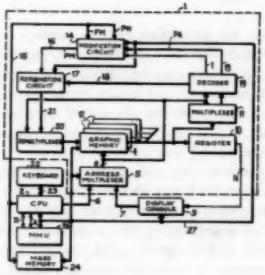
Luc Phan Van Cang, Savigny sur Orge, France, assignor to Thomson Video Equipement, Gennevilliers, France

Filed Apr. 15, 1985, Ser. No. 723,359

Claims priority, application France, Apr. 17, 1984, 84 06052

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—748 **7 Claims**



1. An apparatus for modifying the appearance of the points of an image on a screen of a graphic image television display, controlled by a graphic processor, said apparatus comprising:

a graphic memory storing all the points of the screen interposed between the screen of the display console and the processor, said graphic memory being organized in words of n bits, each bit being representative of the state of a point of the image and having a value of 1 or 0 depending on whether the point which it represents in the image is visible or merges with the background of the image,

an attribute memory containing the attributes of each of the points of the image,

a decoder for selecting a bit from each word read out from the graphic memory,

a modification circuit memory connected to the decoder, to the attribute memory and to the graphic processor for modifying the value of each attribute of the point corresponding to the bit selected of a word by means of modification bits supplied by the processor and a reformation circuit register coupled to the modification circuit, to the decoder and to the graphic memory for updating each modified word and storing it in the graphic memory and storing each modified attribute in the attribute memory, said modification circuit being formed by programmable memories containing function tables for calculating new attribute for modifying the appearance of the points of the graphic image, said function tables being addressed by function bits and modification bits generated by the graphic processor and the attribute bits of each bit of a word selected from the graphic memory.

4,692,760

DISPLAY APPARATUS

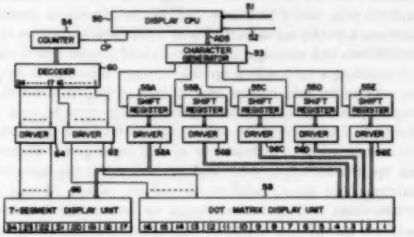
Shohei Unno, Numazu; Mikio Nakakawazi, and Kazufumi Suzuki, both of Shizuoka, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 752,456

Claims priority, application Japan, Jul. 24, 1984, 59-153860

Int. Cl.[4] G09G *3/04, 3/20*

U.S. Cl. 340—756 **5 Claims**



1. A display apparatus comprising:

a dot matrix display unit having a plurality of display regions each having M dot display elements which are arranged substantially in a m×n=M matrix;

a segment display unit having a plurality of display regions each having N (<M) segment display elements which are arranged to have a predetermined pattern;

control means including means for generating display data to designate a character to be displayed in each of the display regions in said dot matrix display unit and segment display unit, and means for sequentially and cyclically activating the display regions in said dot matrix display unit and segment display unit; and

dot data generating means having M output terminals and including character generating means for generating M dot data at said M output terminals, said M dot data corresponding to the display data from said control means, and a driver circuit means for receiving the M dot data from said character generating means for supplying the received M dot data to the M dot display elements in each of the display regions in said dot matrix display unit, and also for supplying N dot data among said received M dot data to said N segment display elements in each of the display regions of said segment display unit, said driver circuit means comprising m register means each for temporarily storing n dot data among m×n dot data from said character generating means, and m drivers connected to respectively receive n dot data from said m register means and which each have output terminals connected to said n dot display elements on the corresponding one of the m columns in each of the display regions of said dot matrix display unit;

and means coupled to the control means for activating only one of the dot matrix display unit and the 7-segment display unit.

4,692,761

ADAPTIVE COMMUNICATION NETWORK AND METHOD

Michael A. Robinton, Palo Alto, Calif., assignor to Robinton Products, Inc., Sunnyvale, Calif.

Filed Jun. 21, 1985, Ser. No. 747,806

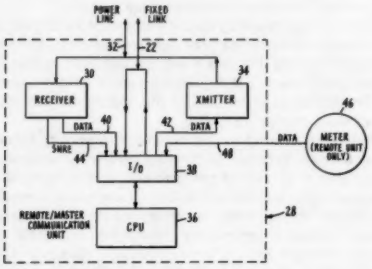
Int. Cl.[4] H04Q *11/00*; H04J *3/00*

U.S. Cl. 340—825.01 **78 Claims**

1. A communication system for use in a network of interconnected communication paths, said system comprising a plurality of communication nodes capable of transmitting messages over the network including a master unit and a plurality of remote units which are also capable of receiving said messages

over the network, with each of said nodes having an associated identifying address, wherein said remote units are capable of initiating a down link message sequence wherein a data package associated with one of said nodes is transferred from a sequence-originating remote unit to said master unit by transmission of at least one of said messages, designated as down link messages, with said down link messages including said data package a source address identifying which of said nodes is associated with said data package in said message, an intermediate source address identifying which of said nodes transmitted said down link message, an intermediate destination address identifying which of said nodes is intended to receive said down link message and wherein said master unit is capable of initiating a responding up link message sequence in response to receipt by said master unit of one of said down link messages, wherein said sequence-originating remote unit is informed of said receipt by said master unit of said data package by transmission of at least one of said messages, designated as an up link message, with said up link messages including an intermediate source address identifying which of said nodes transmitted said up link message, an intermediate destination address identifying which of said nodes is intended to receive said up link message and a final destination address identifying said node associated with said data package received by said master unit with each of said remote units including:

(a) remote input means for receiving said data package, said remote input means including remote receiver means for receiving said messages, said remote receiver means including



direction means for discriminating between said up and down link messages and store and forward means for identifying received messages requiring a transmit action by said receiving remote unit;

(b) remote transmitter means for transmitting said messages in response to receipt of one of said messages requiring said transmit action by said receiving remote unit, said remote transmitter means including down link transmit means for transmitting one of said down link messages containing said data package obtained from said received message in the event said received message is one of said down link messages, said down link transmit means including down link address means for determining said intermediate destination address of said down link messages transmitted by said receiving remote unit utilizing at least one parameter indicative of network conditions obtained, at least in part, from said messages received by said receiving remote unit containing one one of said intermediate destination addresses other than said address of said receiving remote unit and including up link transmit means for transmitting one of said up link messages in the event said received message is one of said up link messages, said up link transmit means including up link address means for determining said intermediate destination address of said transmitted up link message; and

wherein said master unit includes:

(a) master receiver means for receiving said messages, said master receiver means including direction means for discriminating between said up and said down link received messages; and

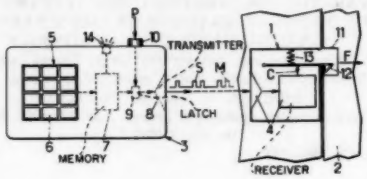
(b) master transmitter means for transmitting said up link messages in response to receipt by said master unit of one of said down link messages.

4,692,762

REMOTE CONTROL CODED DEVICES

Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint Cloud, and Claude Hennion, 18, rue Flatters, 75005 Paris, both of France

Continuation of Ser. No. 495,401, May 17, 1983, abandoned. This application Dec. 31, 1985, Ser. No. 815,751
Claims priority, application France, Jun. 4, 1982, 82 09791
Int. Cl.[4] G08C *19/00*; G08B *5/00*
U.S. Cl. 340—825.69 **6 Claims**



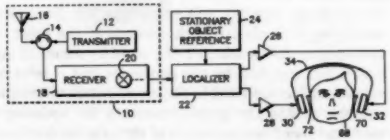
1. A device for providing remote control of a member by means of coded signals, said device comprising a portable pocket size case including transmitter means for transmitting coded signals and a receiver means, mounted on the member to be controlled, for receiving the coded signals, for comparing coded signals with a previously stored reference and for providing predetermined control of said member responsive to a coded signal received by said receiver means and the reference compared therewith being identical, said transmitter means of the case comprising a keyboard with at least two control keys and means for transforming the sequence of actuation of said keys into said coded signals, said transmitter means further comprising means for recording each of said coded signals, for storing each recorded signal in memory for a period of time t_0 of between 3 and 10 minutes and for automatically erasing a stored coded signal at the end of said time period t_0 irrespective of whether the stored code signal has been transmitted and means for ensuring instanteous transmission of the stored coded signal in response to actuation of a single control member.

4,692,763

BINAURAL DOPPLER RADAR TARGET DETECTOR

Ralph C. Gregg, Jr., Tempe, Ariz., assignor to Motorola, Inc., Schaumberg, Ill.

Filed Dec. 23, 1985, Ser. No. 812,601
Int. Cl.[4] G01S *13/56*
U.S. Cl. 342—28 **19 Claims**



1. A target detector providing an auditory output for a target detector operator having left and right ears, said target detector comprising:

a radar having an output which provides a Doppler signal;

a localizer having an input coupled to said radar output and having left and right outputs, said localizer being for providing left and right audio signals;

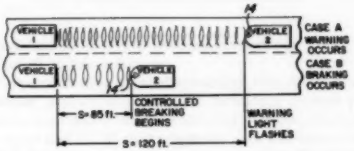
a left speaker coupled to the left output of said localizer; and a right speaker coupled to the right output of said localizer, said left and right speakers producing left and right sounds, respectively, when activated by the left and right audio signals, respectively, and said left and right sounds together causing an auditory effect perceivable as originating from a location having a predetermined relationship to the Doppler signal when heard by the left and right ears, respectively, of the target detector operator.

4,692,764

AUTOMATIC RANGE FINDER AND REMOTE CONTROLLER BRAKING SYSTEM

George D. Bonar, 333 Bowery, New York, N.Y. 10003

Filed Jun. 20, 1986, Ser. No. 876,979
Int. Cl.[4] G01S *13/93*
U.S. Cl. 342—71 **6 Claims**



1. An automatic range finder and remote controlled braking system, comprising:

(a) a radar receiver;

(b) an antenna connected to said radar transceiver, mounted to a vehicle such that said antenna faces in the forward direction relative to the normal direction of travel of said vehicle;

(c) an electrical braking distance setting whose output is an electrical analog of the distance at which said vehicle's brakes are to begin actuating in the presence of an object in front of said antenna;

(d) a distance comparator having three output signals, said comparator compares the distance output of said radar to the distance setting of said braking distance setting system and outputs a first output signal when the distance output of said radar is less than or equal to the distance setting of said braking distance setting system;

(e) a braking system is actuated by the first output signal of said distance comparator, wherein said first output signal of said comparator is proportional to the rate of change of distance between said vehicle and an object with respect to time, and wherein said braking system is capable of proportional control, such that the first output of said distance comparator causes harder braking when said distance between said vehicle and said object is closing rapidly and causes softer braking when said closing is more gradual;

(f) a braking flasher and a braking lamp which are connected to a second output signal of said distance comparator such that when said braking system is actuated said braking lamp flashes, thereby warning the operator that the system is causing said vehicle to brake;

(g) an electrical warning distance setting system whose output is an electrical analog of the distance at which a warning is to be outputted telling an operator of said vehicle that a desired minimum separation has been reached between said operator's vehicle and an object in front of said vehicle; wherein the distance comparator's third output signal is activated whenever the distance between said vehicle and said object are less than the preset warning distance; and

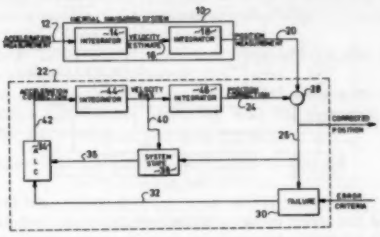
(h) a warning flasher and warning light which are connected to said third output signal of said distance comparator such that when the distance between said vehicle and said object are less than the preset warning distance said warning distance said warning light flashes.

4,692,765

ADAPTIVE LEARNING CONTROLLER FOR SYNTHETIC APERTURE RADAR

Demetrios T. Politis, and William H. Licata, both of Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Dec. 5, 1985, Ser. No. 805,186
Int. Cl.[4] G01S *13/86, 13/90*; G01C *21/16*
U.S. Cl. 342—106 **7 Claims**



1. For use with an inertial navigation system adapted to produce a position measurement signal by integrating both an acceleration measurement signal and the resulting velocity estimate signal, an apparatus for generating velocity bias estimate and position correction signals in order to correct bias errors in the acceleration measurement signal, comprising:

means for adding the position correction signal to the position measurement signal, thereby generating a corrected position signal;

means for comparing the corrected position signal to first predetermined error criteria and generating a first failure signal indicative of a failure of the corrected position signal to meet the first predetermined error criteria;

means, adapted to receive the corrected position signal and velocity bias estimate signal, for generating a system state signal;

adaptive learning controller means, adapted to receive the first failure signal, a second failure signal and the system state signal, for generating an acceleration correction signal in response thereto;

means for integrating the acceleration correction signal to generate the velocity bias estimate signal;

means for integrating the velocity bias estimate signal to create the position correction signal;

means for averaging the acceleration correction signal over a period of time; and

means for comparing the time-averaged acceleration correction signal to second predetermined error criteria and generating a second failure signal indicative of a failure of the time-averaged acceleration correction signal to meet the second predetermined error criteria.

4,692,766

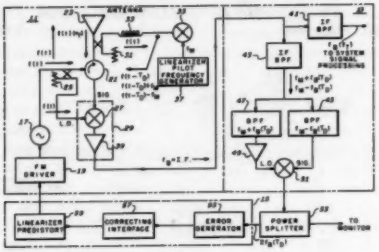
LINEARIZER FREQUENCY DISCRIMINATOR FOR FREQUENCY MODULATED RADAR TRANSMITTERS

John C. Rolfs, deceased, late of Palm Harbor, and by Margaret H. Rolfs, executrix, 1637 Wendle Way, Palm Harbor, both of Fla. 33563

Filed Sep. 25, 1985, Ser. No. 780,114
Int. Cl.[4] G01S *13/32, 7/40*
U.S. Cl. 342—200 **6 Claims**

1. An improved linearizer circuit for use in a frequency modulated continuous wave radar system of the type employing a VCO for generating frequency swept signals to be transmitted and a linearizer feedback circuit which couples a series

of frequency correction signals to the VCO during each frequency sweep, the improved linearizer comprising first and second means for continuously sampling output signals of said VCO, first mixer means coupled to receive signals from said first sampling means, amplitude modulation means for amplitude modulating signals at a modulating frequency, signal delay means coupled between said second sampling means and said amplitude modulation means for providing a time delay to signals incident to and reflected from said amplitude modulation means to couple delayed amplitude modulated signals to



said first mixer means, said delayed amplitude modulated signals having a delay relative to said output signals equal to twice said time delay such that said delayed amplitude modulated signals and sampled output signals coupled from said second sampling means are mixed in said first mixer means to produce an intermediate frequency signal having upper and lower sidebands, filter means coupled to receive said intermediate frequency signal for separating said upper and lower sidebands, and second mixer means coupled to receive said upper and lower sidebands for producing a beat frequency control signal for controlling operations of said linearizer.

4,692,767

METHOD OF MEASURING THE NUCLEAR MAGNETIC RESONANCE FOR USE IN NMR TOMOGRAPHY

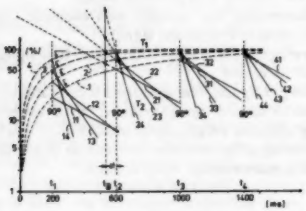
Gernot Bielke, Oestrich-Winkel, Fed. Rep. of Germany, assignor to Bruker Medizintechnik GmbH, Fed. Rep. of Germany

Filed Sep. 27, 1984, Ser. No. 655,168

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3343966

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **4 Claims**



1. A method for measuring the nuclear magnetic resonance in selected areas of a body for two-or three-dimensional image recording (NMR tomography) comprising the steps of:

exposing initially the nuclear spins of a selected type present in the selected areas of the body to a static magnetic field and at least one superimposed gradient field, and exciting them selectively by means of a pulse sequence which causes the nuclear spins to supply in a single pass a plurality of successive induction signals, and

processing thereafter by calculation the induction signals corresponding to each other as regards their succession in time, to form sets of image signals proportional to the induction signals in associated volume elements of the body so that a single measurement provides a plurality of image signal sets corresponding to a sequence of section images differing by the intensity of the induction signals which vary according to the relaxation time T_2,

establishing for each image point associated with a single volume element of the body cross-section a function describing the variation in time of the image signals associated with the respective image points in the different image signal sets, generating thereafter a further image signal set by extrapolating the functions thus established to a pre-determined point of time situated before the measuring moment defined by the start of said pulse sequence, and using the image signal set thus obtained for producing a section image.

4,692,768

FEED DEVICE FOR A SWEEP BEAM ARRAY ANTENNA

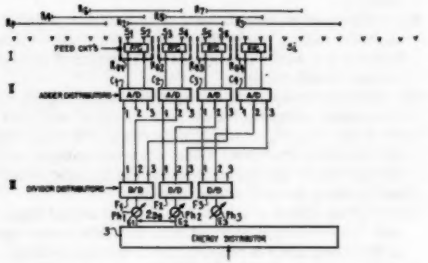
Henri G. Becavin, Bretigny sur Orge, France, assignor to Thomson CSF, Paris, France

Filed Oct. 24, 1983, Ser. No. 545,008

Claims priority, application France, Oct. 26, 1982, 82 17917

Int. Cl.[4] H01Q *3/22, 3/24, 3/26*

U.S. Cl. 342—368 **14 Claims**



1. A feed device for a sweep beam array antennae, the elementary antennae of said array being spaced apart by an elementary interval and divided into several sub-arrays overlapping at their ends, comprising:

means for forming a plurality of elementary groups, each comprising N antennae of said sub-arrays and having N inputs and N outputs, and

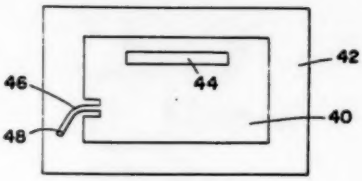
means for combining together an arbitrary number of said elementary groups comprising MN antennae, where M is a whole number greater than N, these means including a number of outputs N equal to the number of inputs of said forming means to which they are connected, and M inputs connected to an energy distributor, spacing between two said sub-arrays being equal to N elementary intervals, said means for combining including a plurality of adder distributor means, each having N outputs coupled to said N inputs of a respective one of said elementary groups, and each having M inputs, each one of said plurality of adder distributor means including weighting means for delivering on said adder distributor means N outputs weighted sums of energies received on said adder distributor means M inputs.

4,692,769

DUAL BAND SLOTTED MICROSTRIP ANTENNA

Michael J. Gegan, Menlo Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1986, Ser. No. 856,569
Int. Cl.[4] H01Q 00/00
U.S. Cl. 343—700 MS 14 Claims



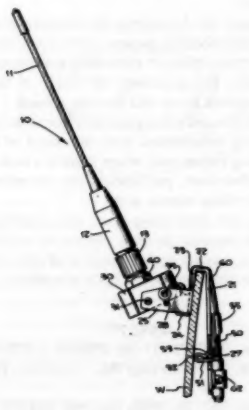
1. A dual-band microstrip antenna comprising:
(a) a thin dielectric substrate;
(b) a thin conductive layer disposed on one surface of said substrate, said conductive layer forming a ground plane;
(c) a thin conductive slotted radiating element disposed on the other surface of said substrate, said radiating element having a first resonance corresponding to the dominant radiation mode that would occur in an unslotted radiating element otherwise identical to the slotted radiating element, said radiating element having a first slot disposed in an area of the radiating element away from the main current path of the radiating element's dominant mode, said radiating element having a second resonance created by said first slot; and
(d) a single microstrip feedline for coupling radio frequency signals to said slotted radiating element, said single feedline being coplanar with said slotted radiating element.

4,692,770

VEHICLE WINDOW MOUNT FOR PORTABLE ANTENNA

Norihisa Kadokura, Tokyo, Japan, assignor to Alliance Research Corporation, Chatsworth, Calif.

Filed Oct. 16, 1985, Ser. No. 788,041
Int. Cl.[4] H01Q 1/32, 1/12
U.S. Cl. 343—715 12 Claims



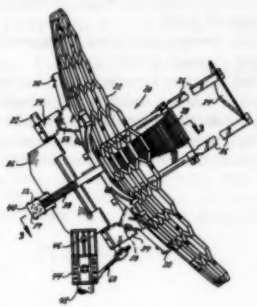
1. A mounting clamp assembly adapted for removably mounting the antenna of a portable communication equipment onto the window of an automotive vehicle such that the antenna will be outside the metal frame of the vehicle while its output signal is delivered to the equipment inside the vehicle, said mounting clamp assembly comprising:
a clamping frame adapted to hook over the upper edge of the window, said clamping frame having depending interior and exterior parts;
a base member secured to said exterior part of said clamping frame;
means for fastening the antenna in a generally vertical position to said base member;
a latch member pivotally attached to said interior part of said frame, said latch member being pivoted between open and locked positions and in its locked position engaging the interior surface of the window so as to frictionally secure said frame upon the window;
a coaxial cable secured upon said frame interior part for connection to the equipment; and
circuit means interconnecting said coaxial cable with the antenna but without interfering with the operation of either the window or said latch member.

4,692,771

ANTENNA DISH REFLECTOR WITH INTEGRAL AZIMUTH TRACK

James N. Rothbarth, St. Louis, Mo., and Edward W. Smith, Los Angeles, Calif., assignors to Satellite Technology Services, Inc., St. Louis, Mo.

Filed Mar. 28, 1985, Ser. No. 717,498
Int. Cl.[4] H01Q 3/02, 3/00
U.S. Cl. 343—882 26 Claims



1. An antenna for receiving satellite broadcast data comprising a main reflector dish, means pivotally mounting said main reflector dish from a support, means to adjust the declination of the dish with respect to the pivotal mounting means, and means to selectively move said main reflector dish about said pivotal mounting means, said moving means comprising an integrally mounted arcuate track and drive means, said arcuate track being secured to the rear of the main reflector dish wherein said arcuate track and drive means are mounted so as not to interfere with the declination adjustment of the dish with respect to the pivotal mounting means.

4,692,772

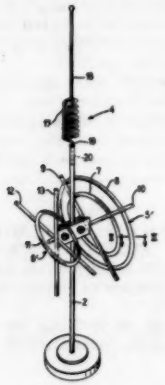
ANTENNA EXTENDED SURFACE ATTACHMENT

Joseph P. Bell, #40 Cedar Village, Punta Gorda, Fla. 33950

Continuation-in-part of Ser. No. 588,332, Mar. 12, 1984, abandoned. This application Sep. 13, 1984, Ser. No. 650,069
Int. Cl.[4] H01Q 9/40
U.S. Cl. 343—899 14 Claims

1. In a supplemental device for mounting on a rod-type antenna of the type in which a pair of assemblies each comprise at least one conductive ring member and a plurality of cooper-

able conductive rod members connected to said at least one ring member symmetrically arranged and physically intersecting each other and the axis of said at least one ring, said at least one ring and the rod members of each assembly connected together and lying in substantially a common plane with the assemblies spaced and connected together substantially coaxially in parallel planes via a cross member which is adapted for mechanical and electrical connection to the antenna such that the antenna is substantially centered between the aforementioned planes, the improvement wherein:



each of said rings comprises a core of plastic material and an outer layer of metal;

the rod-type antenna comprises a first member including a bore, and a second member; and

a metal clad structure constituting said second member and including a winding and first and second projections extending substantially parallel to the axis of the winding, one of said projections received in and making electrical contact with the bore of the first member.

4,692,773

IMAGE FORMING METHOD USING IMAGE FORMING ELEMENTS HAVING DIFFERENT CONCENTRATIONS AND PITCHES

Asao Saito, Fujisawa, and Kunio Watanabe, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 514,622, Jul. 18, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,677

Claims priority, application Japan, Jul. 23, 1982, 57-128567; Jul. 23, 1982, 57-128568; Jul. 23, 1982, 57-128569; Jul. 23, 1982, 57-128570

Int. Cl.[4] G01D *15/16;* **H04N** *1/23*

U.S. Cl. 346—1.1 **10 Claims**

1. A method of forming on a medium an image with areas having different light-reflecting properties providing different optical reflection densities, the method comprising:

providing on the medium a plurality of image forming elements, at least one color of which is provided in different concentrations, with different pitches therebetween in different areas of the image; and

selecting the concentrations of said image forming elements and the pitch thereof in accordance with the optical reflection densities of respective areas of the image to be formed, wherein the pitches of higher concentration

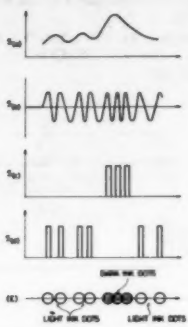


image forming elements are greater than the pitches of lower concentration image forming elements.

4,692,774

MULTI-COLOR RECORDING APPARATUS

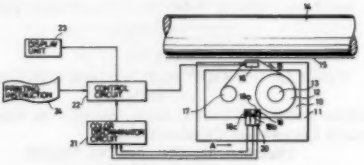
Masasumi Nagashima, Yokosuka; Mineo Nozaki, Kawasaki; Osamu Asakura, Tokyo, and Yoshio Uchikata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 564,407, Dec. 22, 1983, abandoned. This application Nov. 14, 1985, Ser. No. 831,049

Claims priority, application Japan, Dec. 28, 1982, 57-227582

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **15 Claims**



1. A multi-color recording apparatus comprising:

feeding means for feeding a recording material of a determined color;

recording means for depositing the recording material supplied from said feeding means onto a recording sheet in a pattern corresponding to recording information;

detecting means for detecting the color of the recording material supplied from said feeding means;

control means for comparing color information contained in the recording information with the result of detection by said detecting means and, when there is a lack of of coincidence therebetween, prohibiting the recording operation by said recording means; and

alarm means for requesting that said feeding means be changed to another feeding means of a different color when all the recording information of the color detected by said detecting means has been recorded.

4,692,775

DEVICE TO MONITOR PRESS FITTINGS

Edward R. Erwin, 8 Woodbridge Rd., Hamilton, Ontario, Canada L8K 3C7

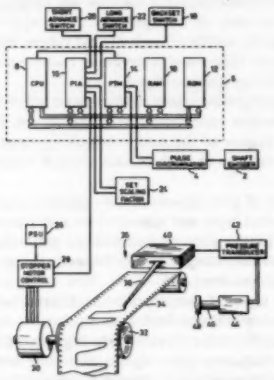
Filed Oct. 28, 1985, Ser. No. 792,329

Int. Cl.[4] G01D *15/16, 9/00*

U.S. Cl. 346—118 **5 Claims**

1. A recorder for monitoring press operations on mechanical

components, comprising a chart recorder having a pen driven by a transducer monitoring pressure applied by a press ram, a chart, and a chart drive operable to displace the chart substantially proportionately to displacement of the press ram, wherein the chart drive is a stepping motor, the press ram is mechanically linked to a displacement decoder providing



output signals indicative both of increments of displacement of said ram and the direction of said increments, said recorder further including means receiving said signals for algebraically summing the value of said increments over discrete intervals of time, and means for applying forward stepping pulses to said motor in predetermined proportions to said increments summed in each said discrete interval.

4,692,776

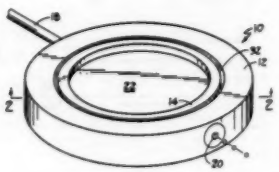
DROP DISPENSING DEVICE AND METHOD FOR ITS MANUFACTURE

Philip M. Kimball, Norwell, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 15, 1986, Ser. No. 906,978

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **14 Claims**



1. In a drop dispensing device having a planar electroactuator bounded by a peripherally circumferential surface for applying a peripherally directed force in response to electrical excitation, means including concentric inner and outer rings for defining an annular chamber about said circumferential surface, and means defining a fluid inlet and a fluid outlet orifice in communication with said annular chamber for dispensing a drop of fluid upon electrical excitation of said electroactuator, the improvement comprising:

means consisting essentially of peripheral contact between and hoop stress in said rings for retaining said inner and outer rings in fluid tight relationship about said annular chamber.

4,692,777

MEANS FOR RESTORING LIQUID DISCHARGE FUNCTION OF A LIQUID JET RECORDER

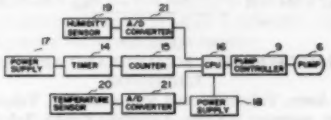
Hiroyuki Hasumi, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 667,365, Nov. 1, 1984, abandoned. This application Dec. 15, 1986, Ser. No. 942,029

Claims priority, application Japan, Nov. 8, 1983, 58-208245

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **8 Claims**



1. A liquid jet recorder comprising:

liquid droplet discharge means for discharging liquid droplets to print a record on a record medium;

droplet discharge function restoring means for restoring said discharge means by performing at least one of a plurality of different discharge restoring functions; and

control means for selecting one of the functions of said droplet discharge function restoring means on the basis of the duration of the time period that said liquid jet recorder has rested without operation of said discharge means and controlling the selected function in accordance with the duration of the time period.

4,692,778

IMAGE FORMATION APPARATUS WITH A RECORDING UNIT AND PAPER FEED COVER AND A SEALING MEMBER

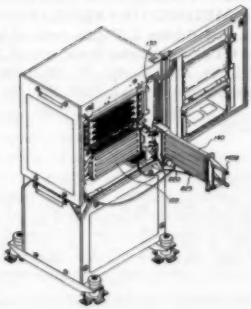
Shigeru Yoshimura, Yokohama; Tetsuo Suzuki, Kawasaki, and Makoto Takemura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,132

Claims priority, application Japan, Mar. 28, 1985, 60-65103; Mar. 28, 1985, 60-65106; Mar. 28, 1985, 60-65108; Mar. 28, 1985, 60-65112; Mar. 28, 1985, 60-65114; Mar. 28, 1985, 60-65116; Mar. 28, 1985, 60-65117; Mar. 28, 1985, 60-65118; Mar. 28, 1985, 60-65119; Mar. 28, 1985, 60-65120; Mar. 28, 1985, 60-65121

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—145 **1 Claim**



1. An image formation apparatus comprising:

recording means storage means for storing recording means for recording on a recording medium at a recording position;

convey means storage means for storing convey means for guiding the recording medium to the recording position

and for detaching the recording medium from the recording position;

open/close means for allowing opening/closure of said convey means storage means and said recording means storage means;

fixing means for keeping said recording means storage means and said convey means storage means in a closed state;

releasing means including an operation member for releasing the closed state obtained by said fixing means; and

a sealing member for closing a mounting portion of said operation member to provide dustproof properties.

4,692,779

IMAGE FORMING METHOD AND APPARATUS THEREFOR

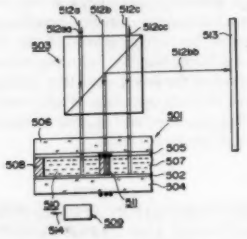
Yujiro Ando, Yokohama, and Sbuzo Kaneko, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 683,862

Claims priority, application Japan, Jan. 6, 1984, 59-000598

Int. Cl.⁴ G01D *15/06, 9/42;* **G02F** *1/13*

U.S. Cl. 346—153.1 **68 Claims**



1. An image forming apparatus comprising:

a device which comprises an electroconductive member, an electric charge accepting member, and a liquid crystal interposed between the electroconductive member and the electric charge accepting member, and

an ion generator for imparting an electric charge to the electric charge accepting member sufficient to form an electric field exceeding the threshold voltage of the liquid crystal between the electric charge accepting member and the electroconductive member.

4,692,780

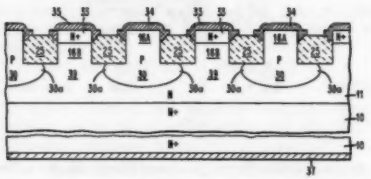
JUNCTION FIELD EFFECT TRANSISTOR AND METHOD OF FABRICATING

Izak Bencuya, and Adrian I. Cogan, both of San Jose, Calif., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 729,025, Apr. 30, 1985, Pat. No. 4,611,384. This application May 12, 1986, Ser. No. 861,681

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **5 Claims**



1. A junction field effect transistor comprising

a body semiconductor material including a first layer of semiconductor material and a second layer of semiconductor material of one conductivity type of relatively low resistivity contiguous with said first layer, said first layer having a surface at a surface of the body;

said first layer having a plurality of parallel grooves therein extending from said surface thereof with ridges of semiconductor material interposed between the grooves, each of said grooves having side walls formed by the adjacent ridges of semiconductor material and having a bottom, the width of each of said grooves being approximately the same as the width of each of said ridges, alternate ridges being gate ridges and intervening ridges between the gate ridges being source ridges;

each of said grooves containing a layer of protective material which is nonconductive at the bottom thereof;

a source region of the one conductivity type of relatively low resistivity in each of said sources ridges at said surface;

a plurality of gate regions of the opposite conductivity type in said first layer and spaced from said second layer, each of said gate regions encompassing a gate ridge and having portions extending laterally beneath the bottoms of the adjacent grooves; and

said first layer of semiconductor material other than said source regions and said gate regions being of the one conductivity type of relatively high resistivity, the portions of adjacent gate regions extending laterally toward each other producing channel regions of the one conductivity of relatively high resistivity therebetween.

4,692,781

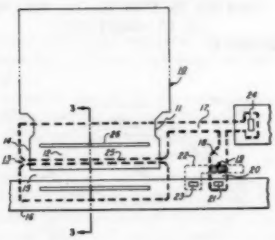
SEMICONDUCTOR DEVICE WITH ELECTROSTATIC DISCHARGE PROTECTION

Robert N. Rountree, Richmond, and Troy H. Herndon, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 6, 1984, Ser. No. 617,876

Int. Cl.⁴ H01L *27/04, 29/78*

U.S. Cl. 357—23.13 **10 Claims**



1. An input protection structure for an MOS device, comprising:

(a) a metal input pad on a face of a silicon chip,

(b) a transistor having a thick gate oxide, having a source-to-drain path connecting said metal input pad to a voltage-supply conductor, having a metal gate, and having a drain region directly connected to said metal gate and metal input pad at an elongated contact area parallel to the width of said source-to-drain path,

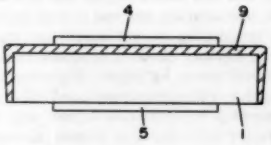
(c) wherein the width of said source-to-drain path is at least about 25 times the length of the source-to-drain path, and wherein the spacing along said face between said source-to-drain path and said elongated contact area is at least about twice said length of the source-to-drain path.

4,692,782

SEMICONDUCTOR RADIOACTIVE RAY DETECTOR

Yasukazu Seki, Tokyo; Noritada Sato, and Masaya Yabe, both of Kanagawa, all of Japan, assignors to Fuji Electric Corporate Research & Development Co., Ltd., Japan

Filed May 24, 1984, Ser. No. 613,890
Claims priority, application Japan, Jun. 8, 1983, 58-102381
Int. Cl.[4] H01L 27/14; G01T 1/22
U.S. Cl. 357—29 4 Claims



1. A semiconductor radiation detector comprising

a single crystal semiconductor substrate having a specific resistance of at least 10 KΩ-cm, and having electrode surfaces separated by side surfaces,

an undoped amorphous semiconductor layer having a specific resistance substantially higher than that of said substrate, said amorphous layer coating at least one of said electrode surfaces at least up to the side surfaces,

a first electrode deposited on said amorphous layer, and

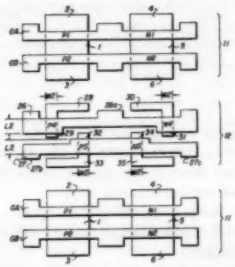
a second electrode deposited over the other of said electrode surfaces.

4,692,783

GATE ARRAY

Hideo Monma, Kawasaki; Masato Ishiguro, Machida, and Tetsuo Kawano, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 656,640, Oct. 1, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,787
Claims priority, application Japan, Sep. 30, 1983, 58-181996
Int. Cl.[4] H01L 27/04, 29/78
U.S. Cl. 357—42 6 Claims



1. A basic cell including a plurality of transistors formed in a semiconductor substrate, said basic cell comprising:

a first p-channel MIS (Metal-Insulator-Semiconductor) transistor and a first n-channel transistor having a first single common gate electrode, a second p-channel MIS transistor and a second n-channel MIS transistor having a second single common gate electrode, said first and second gate electrodes being of substantially the same length and extending parallel to each other in close proximity;

said first p-channel and n-channel transistors having source or drain regions with a gate portion conduction channel of width W formed near opposite ends of said first common gate electrode, a portion of each said source or drain region extending toward the other along said gate electrode at a side opposited to said second common gate electrode;

said second p-channel and n-channel transistors having source or drain regions with a gate portion conduction channel of width W formed apart from each other near the center of said second common gate electrode, a portion of each said source or drain region extending away from the other along said gate electrode at a side opposite to said first common gate electrode;

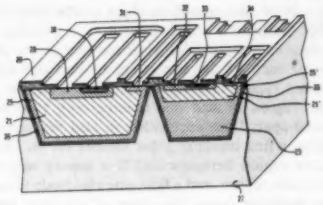
said first and second gate electrodes being broadened in width at each gate portion thereof to provide a gate portion conduction channel of length L whereby a specified W/L ratio is attained in each transistor.

4,692,784

DIELECTRIC INSULATION TYPE SEMICONDUCTOR INTEGRATED CIRCUIT HAVING LOW WITHSTAND VOLTAGE DEVICES AND HIGH WITHSTAND VOLTAGE DEVICES

Tatsuo Negoro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,158
Claims priority, application Japan, Apr. 12, 1983, 58-64069
Int. Cl.[4] H01L 29/06, 27/12, 29/04
U.S. Cl. 357—49 8 Claims



1. A dielectric isolation type semiconductor integrated circuit, comprising:

first and second island regions, each having bottom and side surfaces, each formed of the same conductivity type semiconductor material, and said first and second island regions having substantially the same depth;

each island region having a first portion of a single layer with a first predetermined impurity concentration and a second portion of a single layer with a second predetermined impurity concentration higher than said first predetermined impurity concentration;

the second portion of said first island region being thinner than the second portion of said second island region, the first portion of said first island region having a greater depth than the first portion of the second island region;

a first base portion and a first emitter portion formed in the first portion of each of said first and second island regions, so that a high withstand voltage transistor is formed in said first island region and a low withstand voltage transistor is formed in said second island region;

first and second insulator films coating the bottom and side surfaces of said first and second island regions, respectively; and

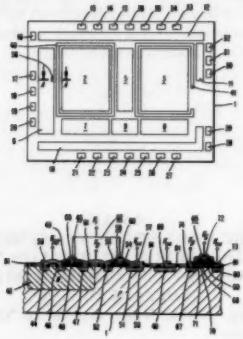
a polycrystalline semiconductor layer in contact with said first and second insulator films and integrally combining said first and second island regions.

4,692,785

INTEGRATED CIRCUIT DEVICE FOR WRITING AND READING INFORMATION

Masashi Wada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 13, 1981, Ser. No. 263,252
Claims priority, application Japan, May 19, 1980, 55-66245
Int. Cl.[4] H01L *29/36*
U.S. Cl. 357—52 **4 Claims**



1. An integrated circuit device for writing and reading information comprising:

a semiconductor substrate of one conductivity type having at least one first semiconductor region of opposite conductivity type;

plural sets of two complementary insulated-gate type field effect transistors which constitute a control circuit for writing and reading information, one of the two transistors of each of the sets being of said one conductivity channel type including a first source region and a first drain region of said one conductivity type and formed spaced-apart from each other in said first semiconductor region, a first insulator layer formed on the first semiconductor region between said first source region and said first drain region, and a first gate electrode formed on said first insulator layer, the other of the two transistors of each of the sets being of said opposite conductivity channel type including a second source region and a second drain region of the opposite conductivity type, formed spaced-apart from each other in said semiconductor substrate, a second insulator layer formed on said substrate between said second source region and said second drain region, and a second gate electrode formed on said second insulator layer; wherein a predetermined voltage is applied between said first and second source regions of said two transistors of each set, the first and second gate electrodes are connected commonly to form an input terminal, and said first and second drain regions of said two transistors of each set are connected commonly to form an output terminal;

a plurality of non-volatile memory elements for storing said information, which memory elements are formed and arranged like a matrix on said semiconductor substrate spaced-apart from said plural sets of two transistors, said non-volatile memory elements being insulated-gate type elements each including a third source region and a third drain region of said opposite conductivity type and being formed spaced-apart from each other in said semiconductor substrate, a third insulator layer formed on said substrate between said third source region and said third drain region, and a third gate electrode formed on said third insulator layer; the information being read out therefrom and being written thereinto by selecting voltages applied to said third source region, said third drain region and said third gate electrode under the control of said control circuit;

a second semiconductor region of said one conductivity type and of a higher impurity concentration than that of said semiconductor substrate, formed near at least one of said field effect transistors of said opposite conductivity channel type, and to which second semiconductor region at a predetermined voltage is applied; and

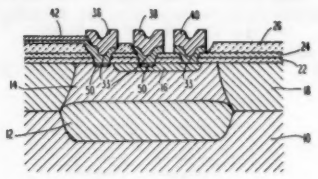
means for suppressing latch-up of a parasitic thyristor formed by said first source region, said first semiconductor region, said substrate, and said second source region as a result of introducing charges into the gate regions of said non-volatile memory elements produced through impact ionization, said means for suppressing comprising a third semiconductor region of said one conductivity type, having an impurity concentration higher than that of the semiconductor substrate and formed surrounding said plurality of non-volatile memory elements in the semiconductor substrate and spaced-apart from the drain regions thereof, and also spaced-apart from both said plural sets of two transistors and from said second semiconductor region, and to which third semiconductor region a predetermined voltage is directly applied to cause current generated in said substrate by operation of said memory elements to be absorbed at said third semiconductor region.

4,692,786

SEMI-CONDUCTOR DEVICE WITH SANDWICH PASSIVATION COATING

Timothy M. Lindenfelser, 1500 Towerview Rd., Eagan, Minn. 55164

Division of Ser. No. 699,028, Feb. 7, 1985, Pat. No. 4,614,666. This application Aug. 21, 1986, Ser. No. 898,717
Int. Cl.[4] H01L *21/316*
U.S. Cl. 357—54 **2 Claims**



1. A semi-conductor device comprising a silicon base with a functional semi-conductor area on the surface thereof and a metallic contact layer overlying and in contact with at least a portion of said semi-conductor area,

said device further including a composite passivation coating overlying substantially all of the remainder of said device surface,

said metallic contact coating including at least one conductive lead extending from a contact point with said underlying semi-conductor area, said conductive lead also overlying said composite passivation coating,

said composite passivation coating comprising a first relatively thin (300–500 Å) silica layer in contact with said device surface, a second nitride layer overlying said first silica layer, and a third silica layer overlying said second layer and interposed between said nitride layer and said overlying conductive lead, the thickness of said third silica layer being 2400–3000 Å, so as to provide, in combination with said first silica layer, preselected electrical characteristics, and to substantially eliminate the adverse effects of undercut of said nitride layer by excessive etching of said first silica layer.

4,692,787

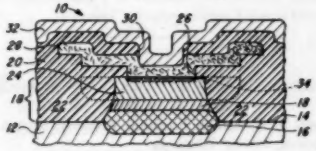
PROGRAMMABLE READ-ONLY-MEMORY ELEMENT WITH POLYCRYSTALLINE SILICON LAYER

Glen G. Possley, Lewisville, and Earl C. Wilson, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 153,463, May 23, 1980, abandoned. This application Mar. 18, 1983, Ser. No. 476,888

Int. Cl.[4] H01L *29/04, 27/04*

U.S. Cl. 357—59 11 Claims



1. A programmable read-only-memory element, comprising:
a substrate;
a monocrystalline silicon layer on the substrate;
a first N-type region in the monocrystalline silicon layer above the substrate;
a second N-type region in the monocrystalline silicon layer above and adjacent to the first N-type region, the second N-type region having a higher resistivity than the first N-type region;
a P-type region in the monocrystalline silicon layer above and adjacent to the second N-type region;
a first PN junction formed at the interface of the P-type region and the second N-type region;
a third N-type region in the monocrystalline silicon layer above and adjacent to the P-type region;
a second PN junction formed at the interface of the third N-type region and the P-type region;
an N-type polycrystalline silicon layer on an upper surface of the monocrystalline silicon layer in contact with the third N-type region;
a metal layer consisting essentially of aluminum contacting the polycrystalline silicon layer above and spaced from the third N-type region;
wherein the vertical dimension from the first PN junction to the polycrystalline silicon layer greatly exceeds the vertical dimension from the second PN junction to the polycrystalline silicon layer, such that a programming voltage impressed on the metal layer relative to the first N-type region to reverse bias the second PN junction will cause aluminum to migrate through the polycrystalline silicon layer to short the second PN junction without shorting the first PN junction.

4,692,788

SEMICONDUCTOR DEVICE WITH SOLDER OVERFLOW PREVENTION GEOMETRY

Masanori Nakatsuka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

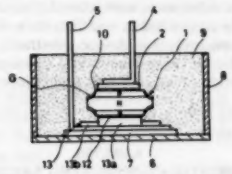
Continuation of Ser. No. 659,349, Oct. 10, 1984. This application Dec. 24, 1986, Ser. No. 946,127

Claims priority, application Japan, Nov. 5, 1983, 58-207721

Int. Cl.[4] H01L *23/28*

U.S. Cl. 357—72 4 Claims

1. A semiconductor apparatus, comprising:
a semiconductor pellet having upper and lower main surfaces,
upper and lower protector plates respectively soldered to said upper and lower main surfaces of said semiconductor pellet to reduce thermal stress,
the whole area of the lower protector plate being larger than the whole area of said lower main surface, said lower protector plate having a separate inner part of molybdenum with its entire upper surface substantially entirely in contact with and of smaller area than the lower main surface and an outer part of copper or like material of lesser thickness than the separate inner part to define therewith a step, the inner part being soldered along said



upper surface to said pellet at said lower main surface region thereof, an upper surface of said outer part thereby being spaced from said lower main surface by a distance corresponding to the height of said step wherein said outer part has a central aperture receiving said inner part in force fitting engagement.

4,692,789

SEMICONDUCTOR APPARATUS

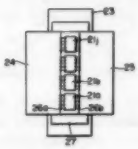
Yoshio Nakamura; Susumo Sugiyama, both of Aichi; Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Miyagi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jul. 22, 1983, Ser. No. 516,543

Claims priority, application Japan, Jul. 23, 1982, 57-127584; Oct. 30, 1982, 57-189983

Int. Cl.[4] H01L *23/02*

U.S. Cl. 357—74 8 Claims



1. A semiconductor apparatus for controlling large current at high speed, comprising:
a plurality of rectangular semiconductor device substrates each having first and second principal surfaces and including a first main electrode and a control electrode on said first principal surface and a second main electrode on said second principal surface,
a first lead conductor of sheet-like metal having good thermal conductivity, said plurality of semiconductor device substrates being aligned in an array on said first lead conductor, said first lead conductor having a sufficient width and length for the placement of said plurality of semiconductor device substrates thereon, said first conductor being electrically connected to said second main electrode,
an insulator surrounding said plurality of semiconductor device substrates, and
relatively wide second and third sheet-like lead conductors having substantially constant widths along the entire cur-

rent paths and electrically insulated from each other in spaced opposed relationship with the array of said semiconductor device substrates interposed therebetween, said second and third lead conductors each having a width greater than the spacing therebetween and at least equal to the sum of the longer sides of said plurality of semiconductor device substrates, said second lead conductor being electrically connected to said first main electrode of each of said semiconductor device substrates, and said third lead conductor being electrically connected to said control electrode of each of said semiconductor device substrates.

4,692,790

STRUCTURE FOR CONNECTING LEADLESS CHIP CARRIER

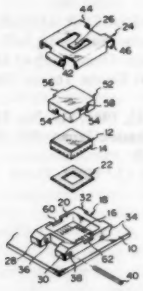
Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 4, 1985, Ser. No. 772,342

Claims priority, application Japan, Sep. 6, 1984, 59-135548[U]; Nov. 27, 1984, 59-179656[U]

Int. Cl.[4] H01L *23/10, 23/02, 23/32*

U.S. Cl. 357—79 **11 Claims**



1. A structure for connecting a first connection pattern provided on a leadless chip carrier to a second connection pattern provided on a receiving surface, said structure comprising:

a support cover receiving and retaining said leadless chip carrier therein and having a plurality of resilient portions for biasing said leadless chip carrier inwardly of said support cover from positions around said periphery of said leadless chip carrier;

a frame for accommodating said support cover in an interior portion thereof in such a manner that said first and second connection patterns are connected to each other, said support cover being retained on the substrate; and

a cover for pressing said support cover toward said substrate to retain said support cover and said leadless chip carrier within said interior of said frame.

4,692,791

MONOLITHIC IMPATT WITH STRIPLINE LEADS

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 630,485, Jul. 13, 1984, Pat. No. 4,596,069. This application Apr. 8, 1986, Ser. No. 849,312

Int. Cl.[4] H01L *23/14, 23/50, 29/90;* **H01P** *3/08*

U.S. Cl. 357—81 **8 Claims**

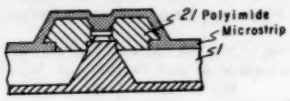
1. A monolithic semiconductor structure which comprises:

(a) a first semiconductor layer including at least one circuit element and having a heat sink on a surface thereof,

(b) a second semiconductor layer disposed on said heat sink,

(c) insulating means insulating said second semiconductor layer from said first semiconductor layer; and

(d) electrically conductive means disposed on said insulating means and coupling by microstrip on said first layer said at



least one circuit element to a microwave diode on or in said second semiconductor layer.

4,692,792

METHOD AND APPARATUS FOR PRODUCING STEREOSCOPIC IMAGES

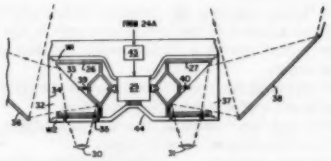
Graham S. B. Street, Reading, England, assignor to Brightad Limited, United Kingdom

Continuation of Ser. No. 638,414, Aug. 7, 1984, Pat. No. 4,641,178. This application Dec. 8, 1986, Ser. No. 939,059

Claims priority, application United Kingdom, Aug. 12, 1983, 8231727

Int. Cl.[4] H04N *15/00*

U.S. Cl. 358—3 **5 Claims**



2. A recording member for forming a stereoscopic image having a plurality of spectral components and which is viewable by supplying to a viewer's left and right eyes respectively light representing first and second perspectives of said image, said recording member including a plurality of first recording locations containing representations of substantially only the first spectral component of light representing said first perspective and the second spectral component of light representing the second perspective, and a plurality of second recording locations containing representations of substantially only the second spectral component of light representing the first perspective and the first spectral component of light representing the second perspective, said first and second recording locations alternating with each other, whereby reproduction from said first and second recording locations in succession provides alternating spectral components for each of said first and second perspectives.

4,692,793

CIRCUIT FOR BLANKING THE VIDEO OF A TELEVISION SET FOR A TIME AFTER TURN-ON

Takahiko Tamura, Tokyo, and Yoshinari Sengoku, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,025

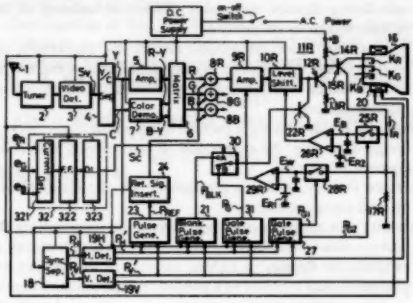
Claims priority, application Japan, Feb. 14, 1985, 60-27420

Int. Cl.[4] H04N *9/73, 9/16*

U.S. Cl. 358—29 **5 Claims**

4. A color television receiver comprising, a three gun color picture tube for displaying a color picture, means for receiving and separating three color drive signals for said three gun color picture tube, a power on-off switch for supplying power to said television receiver, a switching circuit, a gate pulse generator which blanks except during reference signal insertion connected to turn-off said three color drive signals and connected to said switching circuit to deliver a blanking signal, current detecting means connected to said three gun color picture tube

to detect current therein, a switching control signal generator connected to said current detecting means and supplying a control signal to said switching circuit and producing a blanking command signal for a time after said power switch has been



turned on and producing a blanking off signal when the power switch has been turned on for a time sufficient such that said current detecting means detects a sufficient level of current in any of the three guns of said color picture tube.

4,692,794

COLOR IMAGE SENSOR WITH PICTURE ELEMENTS EACH COMPRISING AN M×N MATRIX OF RED, GREEN, AND BLUE PHOTOELECTRIC CONVERSION ELEMENTS FEATURING CONTROLLABLE CHARGE STORAGE TIME AND SELECTIVE READOUT FOR EACH COLOR

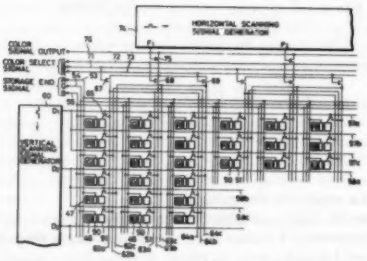
Kenji Suzuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 18, 1986, Ser. No. 830,115

Claims priority, application Japan, Feb. 18, 1985, 60-28188

Int. Cl.⁴ H04N *9/077, 9/04;* **G03B** *27/80*

U.S. Cl. 358—44 **9 Claims**



1. A color image sensor comprising:

three kinds of photoelectric conversion elements (**45, 46, 47**) for photoelectrically converting three primary color components of light, respectively, into signal charges and storing the signal charges therein, said photoelectric conversion elements being arranged in a predetermined order to form a matrix of picture elements, each picture element comprising a matrix of m rows and n columns of said photoelectric conversion elements, m and n being positive integers at least one of which is at least three;

means (**60, 65, 74, 75**) for scanning said picture elements one by one in order to extract said stored signal charges from said photoelectric conversion elements making up said picture elements as color signals;

means (**67, 68, 69, 71, 72, 73**) for specifying which of said three kinds of photoelectric conversion elements is subjected to said extraction of said stored signal charges; and

means (**62a, 62b, 62c, 63a, 63b, 63c, 64a, 64b, 64c**) for adding together the stored signal charges extracted from the photoelectric conversion elements of each picture elements as it is scanned by said scanning means such that stored signals extracted from the same kind of photoelectric conversion element are added together.

4,692,795

COLOR IMAGE READOUT DEVICE WITH DETACHABLE LIGHT SOURCE UNIT

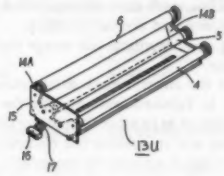
Motokazu Nakao, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1985, Ser. No. 797,893

Claims priority, application Japan, Dec. 17, 1984, 59-191535[U]

Int. Cl.⁴ H04N *1/028, 1/46*

U.S. Cl. 358—75 **6 Claims**



1. A color image readout device comprising:

a main body,

a light source support unit housed in said main body, said light source support unit comprising a plurality of light sources of different color emissions and means for integrally supporting said plurality of light sources,

means for sequentially actuating said plurality of light sources, and

means for receiving light reflected from a document irradiated by said light sources and outputting a color separation signal.

4,692,796

METHOD FOR MANUFACTURING ELECTRIC MASKS USING A COLOR SCANNER AND AN APPARATUS FOR USE THEREIN

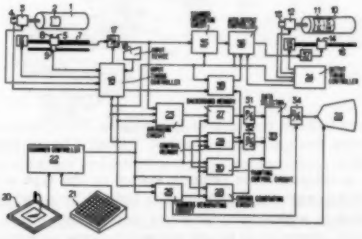
Mitsuhiko Yamada; Kyohei Fujisawa, both of Kyoto, and Hideaki Kitamura, Takatsuki, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 7, 1985, Ser. No. 731,559

Claims priority, application Japan, Jun. 18, 1984, 59-126193

Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—76 **2 Claims**



1. A method for manufacturing electric masks using a color scanner having a CRT monitor and a coordinate input device, comprising:

setting a cutout area of an original picture adhered to an input drum by means of the coordinate input device prior to a subsequent step of duplicating and recording;

roughly scanning an image in said output area at a pitch that is coarser than a scanning pitch in said subsequent step of duplicating and recording, so as to obtain a picture signal;

averaging the picture signal obtained by said rough scanning into rough sampling data;

writing said rough sampling data into the background memory of the CRT monitor;

displaying the rough sampling data written in the memory of the CRT monitor as a picture on the CRT monitor as an image having a matched origin by means of said coordinate input device;

displaying a contour of a desired electric mask while writing the contour of the desired electric mask into a control memory on said picture by using the coordinate input device, and observing the display picture;

manufacturing an electric mask by solidly painting out the contour;

writing electric mask data obtained from said step of manufacturing into said control memory;

duplicating and recording said image including scanning of said image;

reading out the electric mask data written into the control memory in synchronization with the output timing of picture data so as to mask the picture data in real time; and

interpolating and smoothing the electric mask data written into the control memory by means of a smoothing pattern composed of pattern elements equal in size to picture elements corresponding to the picture data at the time of reading out the mask data in synchronization with the output timing of the picture data.

4,692,797

PHOTOGRAPHIC PRINTING SYSTEM

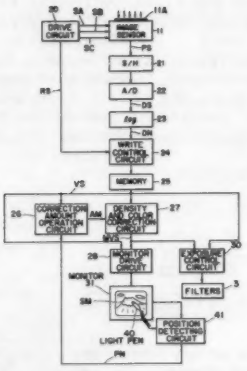
Fumio Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 26, 1985, Ser. No. 802,221

Claims priority, application Japan, Dec. 7, 1984, 59-258753; Apr. 8, 1985, 60-73794; Aug. 26, 1985, 60-185791

Int. Cl.[4] G03B *27/73*; H04N *1/46*

U.S. Cl. 358—76 **21 Claims**



1. A photographic printing system of the type in which a picture image of an original film lighted by a light source is printed on a photographic paper, comprising:

a two-dimensional image sensor for receiving a transmitting light through or reflected light from said picture image on the original film;

a signal processing circuit for processing and storing a signal regarding the picture image from said two-dimensional image sensor;

a correction amount operation circuit for extracting characterized information of the original film from data of the picture image stored in said signal processing circuit and calculating density and color correction amount of the picture image to be printed;

a density and color correction circuit for correcting the picture image data stored in said signal processing circuit in accordance with the calculated density and color correction amount;

a monitor for displaying a picture in response to the picture image data after the correction of said density and color correction circuit;

a device for designating a position of the picture displayed on said monitor; and

a density and color recorrection circuit for recorrecting the picture data of said density and color correction circuit so as make the density or lighted amount of the picture displayed on said monitor to a predetermined value, whereby a photographic printing operation is performed with the recorrected picture data of said density and color recorrection circuit.

4,692,798

APPARATUS AND PROCESS FOR IMPROVING VISIBILITY OF OBJECT WITHIN VISUAL FIELD

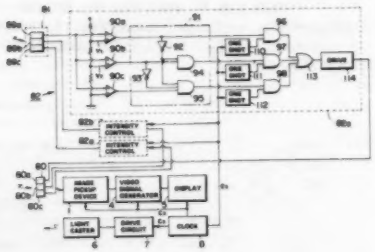
Yasutoshi Seko, Yokohama, and Yuichi Abe, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 7, 1985, Ser. No. 689,243

Claims priority, application Japan, Jan. 9, 1984, 59-1717; Jan. 9, 1984, 59-1719

Int. Cl.[4] H04N *7/18*, *5/225*

U.S. Cl. 358—93 **16 Claims**



1. An apparatus comprising:

means for casting visible light toward a reflective object at a frequency of no less than the critical fusion frequency;

means for picking up an image of the object and outputting image data in accordance with the picked-up image;

a light-intensity sensor monitoring the intensity of a light incident on said image pickup means and outputting a signal representing the level of the intensity of the incident light;

an optical shutter of liquid crystal filtering the incident light;

a light-intensity control circuit opening and shutting said optical shutter in accordance with the frequency of the casting of the visible light and controlling a duty cycle of said optical shutter in response to a level of said signal so as to control an effective transmissivity of said optical shutter;

means for generating a picture signal in accordance with the image data; and

means for displaying a picture of the object in response to the picture signal.

4,692,799

AUTOMATIC INSPECTION SYSTEM FOR DETECTING FOREIGN MATTER

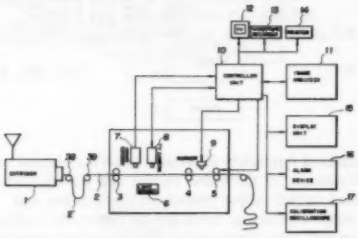
Michihiro Saitoh; Takatoshi Gogami, and Toshiyuki Osada, all of Kanagawa, Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Japan

Continuation of Ser. No. 819,471, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 537,114, Sep. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 374,904, May 4, 1982, abandoned. This application Dec. 29, 1986, Ser. No. 943,813

Claims priority, application Japan, Apr. 5, 1982, 57/56467; Sep. 2, 1983, 58/162395

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—106 3 Claims



1. An automatic inspection system for detecting foreign materials in a resin material sheet, comprising:

an extruder for extruding a resin material into a soft sheet capable of passing light therethrough;

a source of light disposed on one side of said path of travel of said sheet; and

an image sensor camera disposed on the other side of said path of travel of said sheet in confronting relation to said source of light for receiving light emitted from said source of light and having passed through said sheet to detect foreign material included in said sheet;

a pair of freely rotatable rollers disposed between said extruder and said image sensor camera for permitting said sheet to hang down by gravity into a U-shape of a length sufficient to cool and harden said soft sheet, portions of said sheet while hanging down by gravity in a U-shape being substantially perpendicular to said path of travel of said sheet;

sensor means for detecting a vertical position of said U-shaped portion of said sheet, said sensor means including only two sensors spaced apart in a vertical direction at a distance so that said sheet is not detected by either sensor when said sheet hangs down to a positon between said sensors;

means for withdrawing said sheet along a path of travel;

controller means for adjusting the speed of sheet withdrawal for said withdrawing means in response to the output signal for said sensor means, said controller means comprising a main synchronous control system for maintaining the speed of the withdrawal of said sheet by the withdrawing means in synchronization with the rate of extrusion by the extruder, said main synchronous control system including a rotary encoder for detecting the rate of extrusion, the output of said encoder being fed to a digital-to-analog converter that produces an analog signal that is processed and fed to an analog-to-digital converter, the output of the analog-to-digital converter being applied to a pulse amplifier which feeds an amplified signal to a pulse motor for driving said means for withdrawing said sheet, said controller means also comprising a corrective control system for compensating a speed difference between the extrusion rate and the withdrawal speed in response to the output signal from said sensor means, said corrective control system including a voltage to frequency converter for receiving said output signal from said sensor means, the output of said voltage to frequency converter being applied to said pulse amplifier.

4,692,800

AUTOMATIC INSPECTION DEVICE

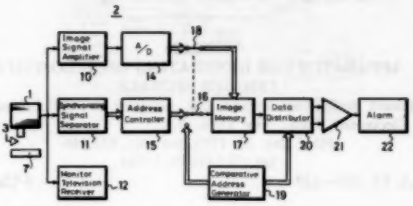
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,759

Claims priority, application Japan, Nov. 22, 1984, 59-247743

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—106 8 Claims



1. A method of automatically inspecting an object, comprising the steps of:

(a) illuminating the object to be inspected;

(b) viewing said object with a single optical image sensor having a target screen which includes a number of picture elements arranged in a mesh pattern to provide an optical image thereof in the form of a video signal;

(c) dividing the optical image of said object received by said sensor into at least two portions which are mutually symmetrical to each other with respect to a line or point; and

(d) comparing sequentially video signals from each of the picture elements at corresponding positions in specifically corresponding parts of said mutually symmetrical portions sequentially with respect to the line or point to thereby determine whether said object has a defect or not.

4,692,801

BANDWIDTH COMPRESSED TRANSMISSION SYSTEM

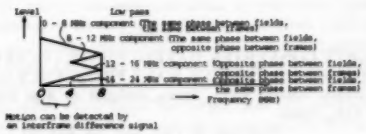
Yuichi Ninomiya; Yoshimichi Ohtsuka; Yoshinori Izumi, and Sei'ichi Goushi, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,232

Claims priority, application Japan, May 20, 1985, 60-106132; Jan. 27, 1986, 61-13631; Jan. 27, 1986, 61-13632

Int. Cl.[4] H04N 7/13

U.S. Cl. 358—133 14 Claims


Level
Low pass
0 - 6 MHz component (The same phase between fields, the same phase between frames)
6 - 12 MHz component (The same phase between fields, opposite phase between frames)
12 - 16 MHz component (Opposite phase between fields, opposite phase between frames)
16 - 24 MHz component (Opposite phase between fields, the same phase between frames)
0
4
8
Frequency (MHz)
Motion can be detected by an interframe difference signal

1. An encoder for compressing a frequency band of a television signal of 2:1 interlace system by carrying out interfield offset subsampling and interframe offset subsampling, comprising:

first sampling means for carrying out interfield offset subsampling of a video signal of said television signal at a timing of a sampling pulse having a first sampling frequency corresponding to a substantially upper limit frequency of said video signal;

a low pass filter to which an output signal from said first

sampling means is applied and for passing a signal component having an aliased portion resulting from said interfield offset subsampling, said low pass filter having a cut-off frequency substantially equal to one half ($\frac{1}{2}$) of said first sampling frequency; and

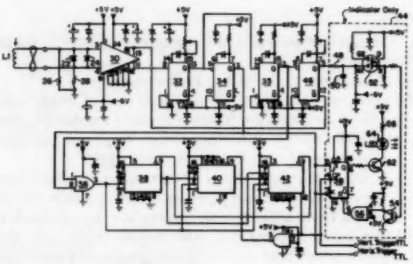
second sampling means to which an output signal from said low pass filter is applied and for carrying out interframe offset subsampling of said output signal at a timing of a sampling pulse having a second sampling frequency which is lower than said first sampling frequency and is higher than one half of said first sampling frequency, so that a multiplexed subsampled transmission signal which does not include an aliased portion of reverse phase results from said interframe offset subsampling.

4,692,802

APPARATUS FOR GENERATING OSCILLOSCOPE TRIGGER SIGNALS

Richard Erski, Fort Wayne, Ind., assignor to NAP Consumer Electronics Corp., New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,146
Int. Cl.[4] H04N *17/04*
U.S. Cl. 358—139 **9 Claims**



1. Apparatus for monitoring horizontal synchronization signals generated in a horizontal synchronization circuit of a television receiver, comprising

inductive pick-up circuit means located in operative proximity to said television receiver for receiving energy radiated by said horizontal synchronization circuit and for generating pick-up signals in response thereto;

processing means connected to said pick-up circuit means for generating horizontal frequency output signals having a predetermined pulse width in response to said pick-up signals; and

output means connected to said processing means for furnishing an output signal indicative of the absence or presence of said pick-up signals.

4,692,803

CATV CONVERTER HAVING PHASE LOCKED LOOP FOR SOUND CARRIER WAVE FREQUENCY CONTROL

Katsumi Tobita, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 4, 1986, Ser. No. 848,731
Claims priority, application Japan, Apr. 4, 1985, 60-72044
Int. Cl.[4] H04N *5/06, 7/06, 7/16*
U.S. Cl. 358—143 **3 Claims**

1. A CATV converter comprising:

a tuner receiving an input CATV signal for a signal of a selected channel;

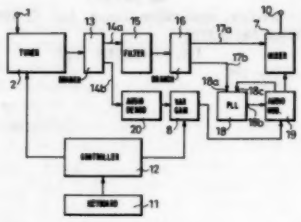
first branching means for bifurcating the selected signal from the tuner into a video carrier and a sound carrier;

an audio demodulator receiving the sound carrier for demodulating the sound carrier into an audio signal and providing the audio signal to an audio modulator;

second branching means for bifurcating the video carrier from the first branching means into two parts;

a mixer receiving a first part of said branched video carrier and a sound carrier output from said audio modulator for providing an output TV signal;

a phase locked loop circuit receiving as inputs a second part of said branched video carrier and a part of the sound carrier output of said audio modulator for providing an output control signal to said audio modulator representing



a selected frequency difference to be maintained between a frequency of the video carrier and a frequency of the sound carrier output provided to said mixer; and

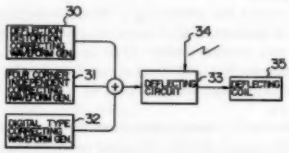
said audio modulator receiving as inputs the audio signal from said audio demodulator and the output control signal of said PLL circuit for providing the sound carrier output having a said sound carrier output frequency which is variably modulated in accordance with the output control signal of said PLL circuit in order to maintain said frequency difference from the video carrier frequency.

4,692,804

IMAGE DISTORTION CORRECTING APPARATUS FOR TELEVISION CAMERA COMBINING GLOBAL AND LOCAL CORRECTIONS

Akira Aoki, Koganei, and Fumio Ukigaya, Higashiyamato, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 831,856
Claims priority, application Japan, Feb. 22, 1985, 60-32722
Int. Cl.[4] H04N *5/228*
U.S. Cl. 358—163 **4 Claims**



1. An image distortion correcting apparatus for a television camera incorporating a plurality of imaging elements, comprising:

at least, a distortion correcting waveform generating circuit of analogue type in which an imaging plane of said television camera is divided into four corner areas for correcting image distortions at said corner areas, respectively, independent of one another;

a distortion correcting waveform generating circuit of digital type in which said imaging plane is divided into horizontal and vertical directions by given numbers of dividing lines, respectively, said digital-type correcting waveform generating circuit storing correcting values for every intersection defined by said dividing lines in the form of digital quantities for generating correcting waveforms on the basis of said digital quantities;

an adder circuit for adding the distortion correcting waveforms produced by both of said distortion correcting waveform generating circuits; and

a deflecting circuit supplied with the output from said adder circuit.

4,692,805

DEVICES USED FOR VARYING THE RESISTANCE OF ELECTRICAL CIRCUITS AND THE CONDUCTION OF CURRENT IN ELECTRICAL CIRCUITS

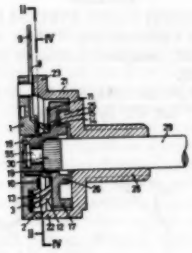
Carlos Lopez, and Jose L. Serrano, both of Tudela, Spain, assignors to Piher Navarra, S.A., Tudela, Spain

Filed Jan. 23, 1985, Ser. No. 694,043

Claims priority, application Spain, Jan. 24, 1984, 529.109

Int. Cl.[4] H01C *10/50*

U.S. Cl. 338—198 **10 Claims**



1. A device forming a combined potentiometer and switch, comprising: a rotatable component having a central protuberance thereon; a potentiometer portion for varying the resistance of an electrical circuit, said potentiometer portion including a casing and a plate joined together to form a body for said potentiometer, said rotatable component extending into said potentiometer body and having a portion of said central protuberance extending through said plate; a first discoidal component carried by said rotatable component; a metallic cursor connected to said discoidal component; a resistance track stationarily mounted on said plate in said body; a metallic collector stationarily mounted on said plate in said body; said cursor being continuously and simultaneously in contact with said resistance track and said collector; a switch portion for changing the state of current conduction in the electrical circuit, said switch portion including a switch protective casing; a second discoidal component mounted in said switch protective casing for engagement by the portion of said central protuberance which extends out of said potentiometer body; cooperating means on the portion of said central protuberance extending through said plate and on said second discoidal component for releasably coupling said second discoidal component to said rotatable component when said switch portion is coupled to said potentiometer portion whereby said second discoidal component can be rotated by said rotatable component; a fixed contact mounted on said switch protective casing; a movable contactor arm movably mounted on said switch protective casing; a contact means on said movable contactor arm for contacting said fixed contact for establishing electrical connection in the electrical circuit; means for moving said movable contactor arm to move said contact means out of contact with said fixed contact and including means connected to said second discoidal component to move said movable contact arm when said rotatable component is rotated; and further including fastening means for connecting said potentiometer body to said switch protective casing.

4,692,806

IMAGE-DATA REDUCTION TECHNIQUE

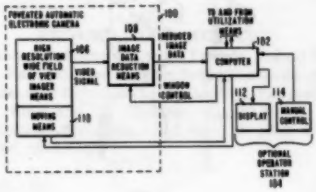
Charles H. Anderson, Somerset County, and Curtis R. Carlson, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

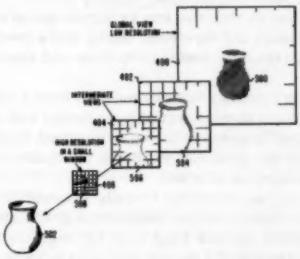
Continuation-in-part of Ser. No. 698,787, Feb. 6, 1983, abandoned. This application Apr. 8, 1986, Ser. No. 850,432

Claims priority, application United Kingdom, Jul. 25, 1985, 8518803

Int. Cl.[4] H04N *5/30*

U.S. Cl. 358—209 **41 Claims**





1. An image data reduction method for use with an input video signal representing a relatively high-spatial-resolution, wide-field-of-view image that is comprised of a first given number of pixels, said method comprising the steps of:

first processing said input video signal to derive therefrom (1) a certain output video signal representing a derived relatively low-spatial-resolution image having a given field-of-view that corresponds to the field of the image represented by said input video signal, said image represented by said certain video signal being comprised of a second given number of pixels smaller than said first given number, and (2) at least one other output video signal representing a derived image having said given field-of-view, said image represented by said one other output video signal exhibiting a resolution equal to or less than said relatively high-spatial-resolution image represented by said input video signal but larger than said relatively low-spatial-resolution derived image represented by said certain output video signal, and said derived image represented by said one other output video signal being comprised of a number of pixels that is equal to or less than said first given number but larger than said second given number; and

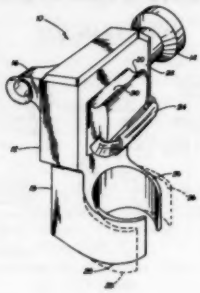
then further processing said one other output video signal to reduce the number of pixels of the derived image represented thereby by passing a spatially-localized subset of pixels thereof through a spatial window, said subset being comprised of no greater number of pixels than said second given number.

4,692,807

ELECTRONIC CAMERA HANDLE CONFIGURATION

Richard C. Kee, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 14, 1986, Ser. No. 852,025
Int. Cl.[4] H04N 5/30
U.S. Cl. 358—229 10 Claims



1. A video camera comprising:

a housing including an upper housing portion operatively connecting an objective lens having an optical center axis therethrough and viewfinder display and a lower housing portion extending downwardly from said upper housing portion;

a hand grip extending laterally outward from a side portion of said upper housing portion and oriented with respect to said upper housing portion so as to extend longitudinally in a direction generally parallel to the optical center axis of said objective lens; and

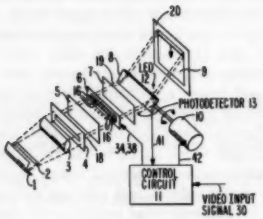
support sections extending laterally outward from a side portion of said lower housing portion at a location generally underlying said hand grip for engaging the wrist and/or forearm of a camera user so as to steady his hand when his hand grasps the hand grip to hold the camera in its normally intended operative position.

4,692,808

PASSIVELY MODULATED PUSH BROOM DISPLAY

Samuel B. Chism, Jr., Houston, Tex., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 2, 1986, Ser. No. 902,811
Int. Cl.[4] H04N 5/74
U.S. Cl. 358—231 8 Claims



1. Apparatus for producing a projected real-time two-dimensional display, comprising:

a stationary two-dimensional screen for receiving the display;

a light source and associated optics for producing a collimated light beam;

a linear array of electronically controlled optical elements for modulating the collimated light beam with input image line-segmented data to form a modulated light beam; and

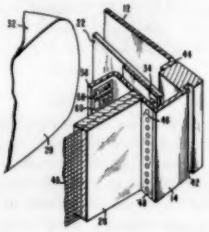
a nutating mirror for sweeping the modulated light beam, in a direction orthogonal to that of the linear array of optical elements, in synchronism with the input image line-segmented data, thereby converting the modulated light beam into a two-dimensional display projected onto the screen.

4,692,809

INTEGRATED TOUCH PAINT SYSTEM FOR DISPLAYS

August H. Beining, Fullerton, and William A. Smith, Laguna Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1984, Ser. No. 673,306
Int. Cl.[4] H04M 5/65
U.S. Cl. 358—247 50 Claims



1. An integrated, electromagnetic energy interference shielding, light beam touch panel system for use in conjunction with a display apparatus having a screen upon which information is displayed, comprising:

a substantially optically transparent faceplate disposed across the screen through which the screen may be viewed;

first means for shielding the faceplate against the propagation through it of electromagnetic energy interference;

a raised border through which the light beams pass disposed at a preselected position in relation to the faceplate to define an active touch panel area over the faceplate;

second means for shielding the raised border against the propagation through it of electromagnetic energy interference, the second means being in electrical contact with the first means;

a bezel mounted at the front of the display apparatus and adjacent the active touch panel area;

third means for shielding the bezel against the propagation through it of electromagnetic energy interference, the third means being in electrical contact with the second means;

an outer enclosure mounted around the sides, top, bottom, and back of the display apparatus and to the bezel; and

fourth means for shielding the outer enclosure against the propagation through it of electromagnetic energy interference, the fourth means being in electrical contact with the third means.

4,692,810

PROCESS FOR PRINTED DRAW-FORMED BODY, AND CONTAINER FORMED BY THIS PROCESS

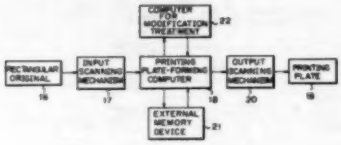
Akihiko Machii; Hiroo Ikegami, both of Yokohama; Masao Ishinabe, Atsugi; Katsuhiro Imazu, Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,465

Claims priority, application Japan, May 22, 1985, 60-108377; May 22, 1985, 60-108378; Oct. 17, 1985, 60-229828

Int. Cl.[4] H04H *1/00*

U.S. Cl. 358—256 8 Claims



1. A process for the preparation of a printed draw-formed body having a printed image on the side wall thereof by subjecting a prior-printed blank to draw-forming, which comprises converting an image of an original to be printed to a digital image element signal on a rectangular coordinate, converting the image element signal on the rectangular coordinate to an image signal or image signals on a corresponding conversion coordinate formed by developing the rectangular coordinate to an annular plane having an area substantially equal to the area of said rectangle, substantially equal to the area of said rectangle, reading image element signals on the conversion coordinate in order of the coordinate, photo-electrically converting the read image element signals to a printing plate for the blank and printing the blank by using the formed printing plate.

4,692,811

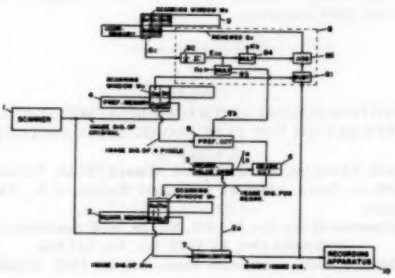
APPARATUS FOR PROCESSING IMAGE SIGNAL

Hiroyoshi Tsuchiya, Kawasaki; Toshiharu Kurosawa, Yokohama; Hirotaka Otsuka, Tama; Yuuji Maruyama, Inagi, and Katsuo Nakazato, Shinjuku, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1985, Ser. No. 758,961

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—282 17 Claims



16. An apparatus for processing image signal comprising;

a memory means for storing error data neighboured to a referred picture element xy, first calculating means for calculating a weighted mean value E_w of said error data neighboured to the referred picture element xy,

second calculating means for adding original image data I_{xy} and a mean error E_a which consists of said weighted mean value E_w as upper bits and lower bits data $E_{x-1,y}(L)$ of the error data of one picture element before as lower bits to obtain a value $I'xy(=Ea+I'xy)$,

a comparator for comparing said value I'xy with a predetermined value to obtain binary signal Pxy,

third calculating means for calculating a difference between said value I'xy and binary signal Pxy as the error data Exy,

means for supplying upper U bits data of said error data Exy to said memory means, and

means for holding lower L bits data of said error data Exy until next picture element processing.

4,692,812

PICTURE IMAGE READER

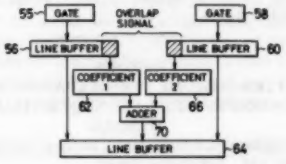
Shuzo Hirahara, Yokohama; Kiyoshi Yamada, Tokyo; Kazuhiko Higuchi, Kawasaki, and Tutomu Saito, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1986, Ser. No. 837,846

Claims priority, application Japan, Mar. 26, 1985, 60-059358; Oct. 28, 1985, 60-240966

Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—285 18 Claims



1. A picture image reader which reads picture image information in an original by illuminating the original with light and by receiving the transmitted or reflected light from the original, comprising:

(a) sensing means for reading picture image information by receiving the light from the original which is illuminated;

(b) moving means for relatively moving said sensing means to the original;

(c) overlapping means for overlapping portions of reading picture images in the picture image reading by said sensing means; and

(d) synthetic picture image formation means for synthesizing picture images of the overlapped portion so as to obtain the picture images coinciding with the picture images in the original, based on each of the picture image information that is read by overlapping the picture images with said sensing means.

4,692,813

APPARATUS FOR CONVERTING RADIATION IMAGE INFORMATION CARRIED BY A STORAGE LAYER INTO A TELEVISION SIGNAL SEQUENCE

Bernhard Conrad, Erlangen, and Guenther Tressl, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1985, Ser. No. 777,438

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435315

Int. Cl.[4] H04N *1/06*

U.S. Cl. 358—294 33 Claims

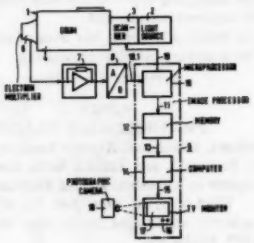
1. An apparatus for converting image information into an electrical signal comprising:

a stationary drum having a radiation-sensitive image storage layer on a longitudinal surface thereof said image storage layer containing image information and emitting radiation corresponding to said information upon stimulation by stimulating radiation;

multiplier means for converting emitted radiation incident thereon into an electrical signal;

a rotatable stimulating radiation deflector disposed substantially centrally inside said drum for directing stimulating radiation onto said storage layer, said rotatable radiation deflector and said storage layer being axially displaceable;

means for conducting said stimulating radiation into an interior of said drum onto said radiation deflector; and



an emitted radiation-guide disposed between said radiation deflector and said multiplier means for coupling a portion of said radiation emitted by said storage layer to said multiplier means.

4,692,814

JITTER-IMMUNE TIME EXPANSION FOR TIME-COMPRESSED LINE-SEQUENTIAL VIDEO SIGNALS

Naomichi Nishimoto, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 31, 1984, Ser. No. 666,732

Claims priority, application Japan, Oct. 31, 1983, 58-205631; Oct. 31, 1983, 58-205632

Int. Cl.[4] H04N *9/89*

U.S. Cl. 358—320 **4 Claims**

1. Apparatus for processing a line sequential video signal including time compressed luminance and chrominance signals, horiziontal sync pulses and vertical sync pulses, one of said horizontal sync pulses coinciding with each of said vertical sync pulses, said video signal being formatted in blocks of video lines, each of said lines containing a group of luminance samples and a group of chrominance samples, the group of said luminance samples being compressed in accordance with a ratio M/N and the group of said chrominance samples being compressed in accordance with a ratio (N-M/N, wherein M and N are integers and is greater than N-M, comprising:

first and second storage means associated with said time compressed luminance signal;

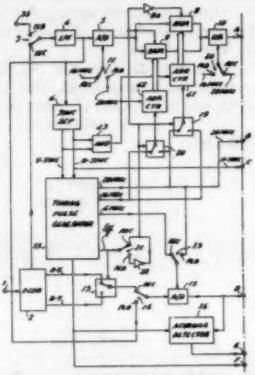
timing means responsive to said horizontal and vertical sync pulses for generating first, second and third frequencies corresponding to the integers, N, M and N-M, respectively;

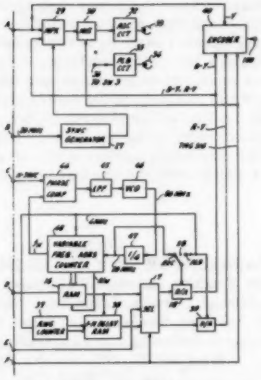
coincidience detecting means for detecting a coincidence between one of said horizontal sync pulses and each of said vertical sync pulses;

first read-write control means responsive to the detection of said coincidence for initiating writing the group of luminance samples during alternate line intervals into said first and second storage means at said first frequency so that the line intervals during which said luminance samples are written into sad first storage means alternate with those during which the luminance samples are written into said second storage means, and reading luminance samples from said first and second storage means during alternate line intervals at said second frequency so that the line intervals during which said luminance samples are read out of said first storage means alternate with those during which the luminance samples are read out of said second storage means;

third storage means associated with said time compressed chrominance signal; and

second read-write control means responsive to each of said horizontal sync pulses for storing the group of said chrominance samples of each video line into said third storge





means at said first frequency and subsequently reading chrominance samples out of the third storage means at said third frequency.

4,692,815

PHOTOGRAPHING AND RECORDING METHOD AND APPARATUS FOR ELECTRONIC STILL PICTURE CAMERAS

Atsushi Kawahara, Kawasaki, and Masaya Okita, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 634,409, Jul. 25, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 921,844

Claims priority, application Japan, Jul. 28, 1983, 58-136749; Dec. 23, 1983, 58-242102

Int. Cl.[4] H04N *5/781*

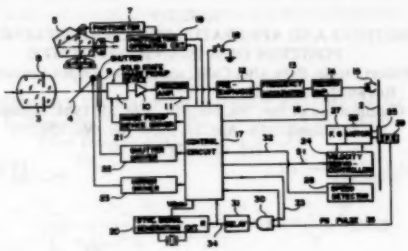
U.S. Cl. 358—335 **5 Claims**

1. An apparatus for an electrical still picture camera including image pickup means for storing charges corresponding to an image of an object at a photosensitive surface and generating a picture signal indicative of said image, exposure means for controlling an exposure of said photosensitive surface by said image, first generating means for generating a vertical synchronizing signal, means for recording said picture signal

on a disk in accordance with said vertical synchronizing signal, and a motor for rotating said disk, said apparatus comprising:

(a) means for controlling said motor so that the period of the rotation of said disk substantially coincides with the period of said vertical synchronizing signal;

(b) means for detecting that the period of the rotation of said disk substantially coincides with the period of said vertical synchronizing signal and for producing a detection signal;



(c) second generating means connected to said motor for genreating a pulse every rotation of said disk: and

(d) shifting means responsive to said detecting signal following a beginning of said exposure for causing for causing said first generating means to shift a phase of said vertical synchronizing signal for every pulse generated, said shifting means shifting the phase of said vertical synchronizing signal to produce a predetermined phase difference between said pulses and said vertical synchronizing signal.

4,692,816

DIGITAL DATA TRANSMITTING SYSTEM FOR TRANSMITTING DIGITAL DATA A NUMBER OF TIMES DEPENDING ON AN INFORMATION CONTENT OF THE DIGITAL DATA

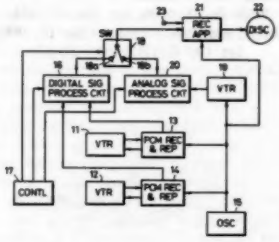
Hiroyuki Sugiyama, Isehara; Nobuaki Takahashi, Yamato; Takeshi Shibamoto, Sagamihara; Kazunori Nishikawa, Machida, and Makoto Komura, Tokyo, all of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Japan

Filed Jul. 2, 1984, Ser. No. 626,700

Claims priority, application Japan, Jul. 8, 1983, 58-124217; Jul. 8, 1983, 58-124218

Int. Cl.[4] H04N *5/85*; G11B *20/12*

U.S. Cl. 358—342 **5 Claims**



1. A digital data transmitting system for transmitting a plurality of channels of digital data through a transmitting medium such as a recording medium, said plurality of channels of digital data being obtained by subjecting information signals to a digital modulation, said information signals comprising a non-compressed audio signal, a video signal, and an information signal other than the non-compressed audio signal and the video signal, said digital data transmitting system comprising:

first means for transmitting a channel of digital information signal data which are obtained by subjecting said information signal to the digital modulation, said digital information signal data being divided into sectors each having k words, where k is a natural number, and being transmitted within a predetermined transmission time period so that a sector is transmitted once or repeatedly a number of times depending on an information content of the sector; and

second means for adding a first code and a first synchronizing signal to each sector of said digital information signal data which are obtained from said first means, and for transmitting the digital information signal data which have the sectors added with said first code and said first synchronizing signal, said first code assuming the same value for sectors which are repeatedly transmitted within said predetermined transmission time period,

each of said sectors being transmitted with a signal format in which a mode code indicative of a kind of the information content of the sector, a first error detecting code, and a second code indicative of a sequence of the sector within said predetermined transmission time period, are time-sequentially transmitted together with said first code and said first synchronizing signal which are obtained from said second means, said mode code being made up of a first mode code indicative of the kind of the information content of the sector when upper and lower parts of each word of the sector are of the same kind, and a second mode code indicative of a combination of the different kinks when the upper and lower parts of each word of the sector are of different kinds.

4,692,817

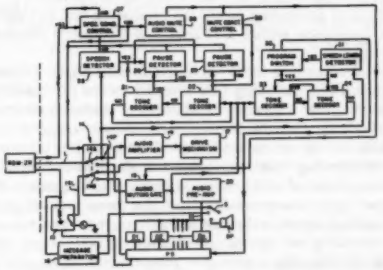
PROGRAMMED CONVERSATION RECORDING SYSTEM

Peter F. Theis, McHenry, Ill., assignor to Morgan Industries, Inc., Gurnee, Ill.

Continuation of Ser. No. 334,243, Dec. 24, 1981, Pat. No. 4,539,436, which is a continuation-in-part of Ser. No. 856,105, Nov. 30, 1977, Pat. No. 4,328,396, which is a continuation-in-part of Ser. No. 605,240, Aug. 18, 1975, Pat. No. 4,506,393, which is a continuation-in-part of Ser. No. 439,445, Feb. 4, 1974, Pat. No. 4,496,601, and a continuation-in-part of Ser. No. 604,390, Aug. 15, 1975, Pat. No. 4,660,120. This application May 9, 1985, Ser. No. 732,513

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—12 **2 Claims**



1. An apparatus for carrying on a programmed conversation with a respondent, comprising:

a message storage unit operative to store a sequence of audio messages for playback to the respondent;

a response recorder unit operative to record responses of the respondent after individual ones of the audio messages;

a pause detector coupled to the message storage unit to initiate playback of a next one of the audio messages automatically following a pause exceeding a selected duration in a response of the respondent;

an alternate message storage unit operative to store an alternate audio message for playback to the respondent; and

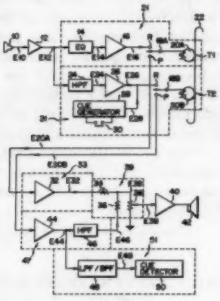
means for activating the alternate message storage unit to cause playback of the alternate audio message only in the event the respondent responds to a designated one of the audio messages and the respondent's response to said designated one of the audio messages has a duration within a selected time interval.

4,692,818

DUAL AUDIO TRACK RECORDING SYSTEM IN WHICH ONE TRACK ALSO CONTAINS A CONTROL SIGNAL

Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,890
Int. Cl.[4] G11B *15/087*
U.S. Cl. 360—22 **18 Claims**



3. A multitrack cue recording system for a magnetic recorder, wherein a first track of the multitrack is used for a recording signal and a second track is used for a cue signal of a certain frequency and a signal derived from the recording signal, said recording system comprising:

means for producing a recording signal;

first recording means coupled to said signal producing means for recording, on said first track, first information representing only said recording signal, said first recording means including equalizer means for boosting, recording said first information, a first low-frequency component of said recording signal over a first low-frequency component range which includes a cue signal frequency;

cue signal generating means for producing said cue signal at a frequency within said first low-frequency component range;

second recording means coupled to said signal producing means and including first filtering means for removing a second low-frequency component of said recording signal over a second low-frequency component range to form a low-cut signal, means for producing second information representing said cue signal and the low-cut signal, the magnitude of said low-cut signal at the frequency of said cue signal being smaller than the magnitude of said recording signal at the cue signal frequency, and means for recording said second information on said second track;

first reproducing means for reproducing, from said first track, a first reproduction signal representing said first information wherein said first low-frequency component of the recording signal is boosted by said equalizer means;

second reproducing means including second filtering means for reproducing, from said second track, a second reproduction signal at an output of said second filtering means representing only said low-cut signal, said second reproducing means providing at an output of said second filtering means, a third reproduction signal representing said second information;

signal mixing means for mixing said first reproduction signal with said second reproduction signal, and for providing a playback signal corresponding only to said recording signal wherein said removed second low-frequency component is compensated by said boosted first low-frequency component so that low-frequency components of said recording signal are reproduced substantially flat in said playback signal absent said cue signal; and

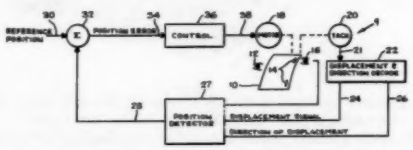
cue signal detecting means coupled to said input of said second filtering means for detecting, from said third reproduction signal, said cue signal.

4,692,819

METHOD AND APPARATUS FOR CONTROLLING THE POSITION OF A TRANSPORTED WEB

Robert Steele, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 646,619, Aug. 31, 1984, abandoned.
This application Apr. 16, 1986, Ser. No. 854,711
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—72.1 **18 Claims**



18. Method for the determining of a distance between a selected location on a transportable web and a fixed point along the web's path of travel, comprising the steps of:

generating a first signal indicating the distance between the selected location on the web and the fixed point according to one of a plurality of periodic location indicators located contiguously with the web;

generating a second signal, independently of the periodic location indicators, indicating the distance between the selected location on the web and the one of the periodic location indicator;

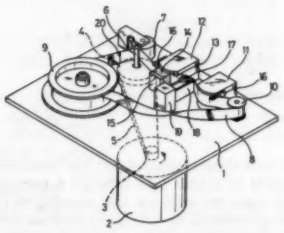
generating a location in response t the first signal and the second signal such that said location signal reflects the location of said web.

4,692,820

HEAD-POSITIONING MECHANISM FOR AN ENDLESS TAPE

Koichi Sakurai, 316-77, Oaza Kozenji, Oora-machi, Oora-gun, Gunma, and Minoru Kojima, 22-7, Misono-machi, Tatebayashi-shi, Gunma, both of Japan

Filed Jul. 3, 1986, Ser. No. 881,621
Claims priority, application Japan, May 19, 1986, 61-114365
Int. Cl.[4] G11B *15/06, 23/32*
U.S. Cl. 360—74.7 **1 Claim**



1. A head-positioning mechanism for an endless tape, in which the endless tape fed between the capstan rotatable at a constant speed by a DC motor and a pinch roller urged against the tape is run in a closed loop through a feeding/winding reel

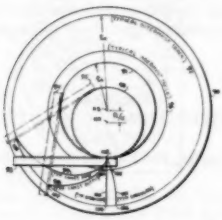
and a tape guide, said endless tape having an inner and an outer surface, said tape on its outer surface between said pinch roller and said tape guide being contacted sequentially with a surface of an erasing, recording or playing-back head, characterized in that the endless tape on its inner side between the capstan and the tape guide is provided with an electrically conductive sensor, that the endless tape at a predetermined site thereof is provided with a cut-line and that the endless tape on its inner surface is normally supplied with a faint current for deenergizing a power source for said DC motor upon contact of said cut-line with said sensor, thereby to arrest a head of the endless tape at a starting position.

4,692,821

DISC MEMORY STORAGE APPARATUS AND METHOD

George E. Zenzefilis, 27 Vientos Rd., Camarillo, Calif. 93010

Filed Dec. 31, 1985, Ser. No. 815,371
Int. Cl.[4] G11B *5/55, 27/10*
U.S. Cl. 360—78 23 Claims



1. A disc memory storage device for recording and reading information magnetically, comprising:

a rotating set of parallel discs having a plurality of concentrically arranged circular storage tracks serviced by a plurality of magnetic heads, one or more per disc surface, and each provided with an operative gap for transducing information to and from said tracks; and

means for displacing each of said heads on a path substantially in the form of an involute of a circle, the gap of each of said heads being substantially tangent to said path, said involute path having a basic circle substantially concentric with the magnetic disc center and whose radius is equal to the radius of the innermost track serviced.

5. A disc memory storage device for recording and reading information magnetically, comprising:

a rotating set of parallel discs having a plurality of concentrically arranged circular storage tracks serviced by a plurality of magnetic heads, one or more per disc surface, and each provided with an operative gap for transducing information to and from said tracks;

means for displacing each of said heads on a path substantially rectilinear, the gap of each of said heads being substantially perpendicular to said path; and

means for delaying the issuing of the disc index or clock and hence the recording directly proportional to the travel of said heads, starting from their innermost position.

7. A system for enhancing the storage capability of a disc storage medium storing information in a plurality of rotary tracks as a series of changes of state of the incremental storage medium induced by a transducer traversing the surface of the disc between inner and outer tracks as the disc rotates, the stored information being phase coherent from track to track with the imprints corresponding to changes of state for respective data elements between innermost and outermost tracks forming a plurality of elemental lines representing the transducer progress path, said system comprising:

a transducer positioning mechanism for supporting and driving the transducer to traverse the disc surface between inner and outer tracks; and

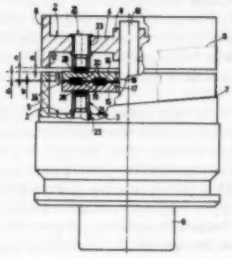
means for controlling said mechanism to cause the transducer to traverse the disc surface between inner and outer tracks along a predetermined transducer progress path, thereby forming a plurality of elemental lines representing the storage of information on the disc, each elemental line being substantially an involute curve in the portion between innermost and outermost tracks.

4,692,822

MAGNETIC TAPE SCANNING UNIT AND METHOD OF ASSEMBLY THEREOF

Mariusz Kabacinski, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,560
Claims priority, application Austria, Apr. 30, 1984, 1434/84
Int. Cl.[4] G11B *5/027, 15/60*
U.S. Cl. 360—84 5 Claims



1. A drum-shaped magnetic tape scanning unit around whose circumferential surface a record-carrier tape can be wrapped at a predetermined angle, such scanning unit comprising: a stationary drum section and a rotatable drum section coaxial therewith, one end of each drum section facing one end of the other drum section; and a two-part rotary transformer comprising two planar transformer discs of ferrite material, each disc carrying at least one transformer winding; the discs being arranged coaxially on the facing ends of the rotatable drum section and the stationary drum section, respectively, so that a surface of each disc faces and is spaced from a surface of the other disc; at least one of the drum sections having at least three angularly spaced parallel bores therein holding respective supporting elements for supporting the transformer disc on such drum section, characterized in that:

said supporting elements are in the form of cylindrical sleeves of weldable material which are open at one end and closed at the other end, the closed end of each sleeve projecting from the end of said at least one of the drum sections which faces the end of the other drum section;

the transformer disc on said at least one of the drum sections has planar mounting elements thereon, a surface of respective ones of said mounting elements being coaxial with and facing the closed end of respective ones of the sleeves held by said at least one of the drum sections, such mounting elements being of a weldable material; and

the closed end of each of said sleeves is welded to the surface of the mounting element facing such closed end.

4,692,823

TAPE LOADING DEVICE FOR A VIDEO TAPE RECORDER

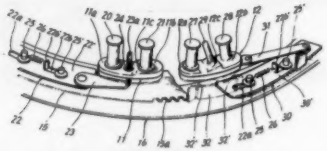
Seong T. Gwon, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 28, 1985, Ser. No. 749,647

Claims priority, application Rep. of Korea, Jun. 30, 1984, 3765/84

Int. Cl.[4] G11B *15/61, 15/665*

U.S. Cl. 360—85 **4 Claims**



1. A tape loading device for a video tape recorder comprising:

a deck having an upper surface for loading a tape cassette on the front portion thereof;

an inclined rotary head drum disposed at the center portion of said deck, said drum having a helical tape guide;

a loading plate disposed around said rotary drum having a lower surface and provided with a main guideway extending substantially throughout the periphery thereof and a by-pass way branching out at one side of said main guideway said loading plate having a predetermined inclination;

upper and lower loading rings disposed between said upper surface of said deck and said lower surface of said loading plate;

means for driving said loading rings through a plurality of gears, the driving force from said means being transferred to said upper loading ring through a plurality of gears including an upper loading gear, and to said lower loading ring through a lower loading gear which is interlocked with said upper loading gear according to the rotation of said upper loading ring being progressed;

upper and lower over-stroke absorbing units mounted on respective surfaces of both loading rings;

a lead base connected to said upper over-stroke absorbing unit mounted on said upper loading ring guided along said main guideway for traveling to the final travel end thereof, said lead base having a front-upper surface carrying a first rotatable post thereon, a rear-upper surface carrying a second rotatable post thereon, and an inclined surface disposed between said front and rear upper surfaces and provided with a hole;

a trailer base connected to said over-stroke absorbing unit mounted on said lower loading ring and guided first along said main guideway and then along said by-pass way by traveling to the final travel end thereof, said trailer base having a front-upper surface carrying a first rotatable post thereon, a rear-upper surface carrying a second rotatable post thereon, and an inclined surface disposed between said front and rear upper thereon; and

two stoppers disposed respectively on the final travel ends of said main guideway and said by-pass way and adapted to stop the travel of said lead base and said trailer base;

said lead and trailer bases moving from a preload position to a full load position with related posts according to various loading positions thereof engaging the tape in a cassette and drawing the tape to full load positions on and relative to said head drum, said second rotatable post of the trailer base being vertically disposed with respect to the base plane of the deck in the full loading state of the tape so that the tape traveling between said vertical second rotatable post and the tape supplying area of the tape cassette is horizontally fed with respect to the base plane of the deck, said first rotatable post of said trailer base and both rotatable posts of said lead base being vertically positioned with respect to the inclined surface of said loading plate, so that they have respective inclinations and orientations corresponding to the direction of the tape coming in an inlet side of said rotary drum.

4,692,824

MAGNETIC RECORDING/REPRODUCING APPARATUS

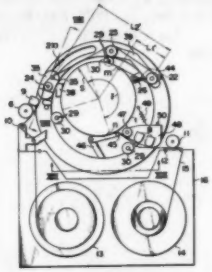
Masayuki Takahara, and Motoyasu Momoki, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 564,336, Dec. 22, 1983. This application Sep. 16, 1986, Ser. No. 910,276

Claims priority, application Japan, Dec. 28, 1982, 57-231343

Int. Cl.[4] G11B *5/08*

U.S. Cl. 360—85 **9 Claims**



1. A μ-type of magnetic recording/reproducing apparatus using a tape loading system comprising: a rotary head cylinder mounted on a chassis in an inclined manner and which rotates in one direction; a loading ring to be rotated around said rotary head cylinder; a first guide roller mounted on said loading ring, being movable, upon rotation of said loading ring, between a first position wherein said first guide roller is located in an opening of a cassette, said cassette being located in a vicinity of said rotary head cylinder and storing a magnetic recording tape therein, and a second position wherein said first guide roller is located outside said opening of said cassette, engaged with the magnetic recording tape stored in said cassette and retaining the magnetic recording tape so that it is wound from a tape entrance point to a tape exit point on the peripheral surface of said rotary head cylinder as said first guide roller moves from the first position to the second position thereof; said first guide roller when located in said second position being positioned substantially less than 28 mm upstream of said rotary head cylinder along a tape travel direction for guiding the magnetic recording tape onto the peripheral surface of said rotary head cylinder; a second guide roller being movable between a first position wherein said second guide roller is located in said opening of said cassette and a second position wherein said second guide roller is located outside said opening of said cassette, its movement from the first position to the second position thereof corresponding to movement of said first guide roller from the first position to the second position thereof upon rotation of said loading ring, said second guide roller when in its second position engaging magnetic recording tape pulled out from said cassette and being positioned upstream of said first guide roller along a tape travel direction to retain said magnetic recording tape traveling from upstream of said second guide roller to said first guide roller from being brought into contact with said peripheral surface of said rotary head cylinder; a tilt post being movable between a first position wherein said tilt post is located in said opening of said cassette and a second position wherein said tilt post is located outside said opening, its movement from the first position to the second position thereof corresponding to movement of said first guide roller from the first position to the second position thereof upon rotation of said loading ring, said tilt post in its

second position engaging magnetic recording tape pulled out from said cassette and being positioned upstream of said second guide roller along the tape travel direction to prevent said magnetic recording tape traveling from said cassette to said second guide roller from being brought into contact with said peripheral surface of said rotary head cylinder and guiding the magnetic recording tape from said cassette to said first guide roller through said second guide roller; a tilt subpost; and means to dispose said tilt subpost in the immediately adjacent vicinity of the tape exit point on the outer surface of said rotary cylinder to bring the tilt subpost into contact with the magnetic recording tape fed from said rotary head cylinder to align a longitudinal edge of said magnetic recording tape between the tape exit point and a capstan to be substantially parallel with said chassis,

said rotary head cylinder being inclined toward a point located on the peripheral surface of said rotary head cylinder through an angular distance of 139° to 229° in a direction of the running of said magnetic recording tape on the peripheral surface of said rotary head cylinder from a point where the magnetic recording tape is separated from said rotary head cylinder, whereby a size reduction of a μ-type magnetic recording/reproducing apparatus is achieved.

4,692,825

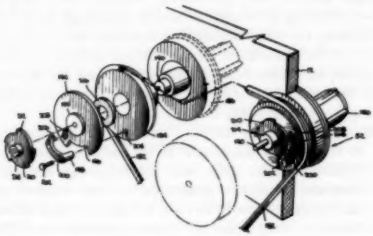
ONE-WAY CLUTCH ASSEMBLY WITH PAWL AND RATCHET

Andre Debaudringhien, Norwalk, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Feb. 11, 1983, Ser. No. 465,855

Int. Cl.⁴ G11B *15/24*; F16D *11/00*

U.S. Cl. 360—96.3 **7 Claims**



1. A one way clutch assembly, comprising:

a frame;

a bearing member having a central bore therein fixedly secured to said frame;

a pulley rotatably mounted on said bearing member;

a drive spindle rotatably mounted within said bearing member central bore;

a cam plate rotatably mounted aboat said drive spindle, said cam plate being substantially circular in cross-section and including an arcuate shaped recess in one segment of the circular periphery and also provided with a camming surface interior of the peripheral extent;

a mounting stud fixedly secured to and projecting from said pulley through said arcuate recess in said cam plate;

a pawl rotatably mounted at one end on said mounting stud and having a pin at the other end extending into said interior camming surface of said cam plate and in operable contact therewith so that said pawl is engageable with said camming surface and movable radially inwardly and outwardly solely by its engagement with said interior camming surface; and

a ratchet plate fixedly mounted on said drive spindle for rotation therewith, said ratchet plate having a plurality of ratchet teeth for engagement and disengagement with said pawl.

4,692,826

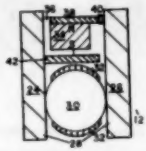
BEARING ASSEMBLY WITH INTEGRATED FERROFLUID SEAL

Kuldip Raj, Merrimack, and Raoul Casciari, Bedford, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation of Ser. No. 526,781, Aug. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 450,339, Dec. 16, 1982, Pat. No. 4,407,508. This application Apr. 14, 1986, Ser. No. 851,799

Int. Cl.⁴ G11B *5/012*

U.S. Cl. 360—97 **15 Claims**



1. A bearing assembly with an integrated ferrofluid seal, which assembly comprises:

(a) a magnetically permeable bearing assembly adapted to surround a rotatable shaft and having an inner race and a spaced-apart outer race to define a raceway therebetween, and roller elements retained in the raceway to provide for rotating of the inner and outer races relative to one another; and

(b) a ferrofluid seal appratus in the raceway and generally closely adjacent the roller elements of the bearing assembly, which ferrofluid seal apparatus comprises:

(i) a single magnetic pole piece having a one and other end, the one end radially extending into a close, noncontacting relationship with a surface of the inner or outer race, to define a small radial gap,

(ii) an annular, axially-polarized permanent magnet having a radially disposed one periphery and another periphery relative to the axis of the shaft, the one periphery of the permanent magnet extending toward said radial gap to form an air gap with said race surface,

(iii) ferrofluid retained in the radial gap by magnetic flux of the permanent magnet, to provide a ferrofluid exclusion seal with the said surface,

(iv) a nonmagnetic housing positioned about the other periphery of the permanent magnet to divert the magnetic flux of the permanent magnet toward the said magnetically permeable race surface which forms the said radial and air gap, and

(v) the magnetic flux circuit passing through the pole piece, the permanent magnet, the ferrofluid in the radial gap, said surface and the air gap.

4,692,827

DIVIDED HOUSING FOR A MAGNETIC DISK DRIVE COMPRISING A PERIPHERAL SEALING RING

Johann Biermeier, Munich, and Heinz Obermayer, Grafrath, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,204

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404241

Int. Cl.⁴ G11B *00/00*

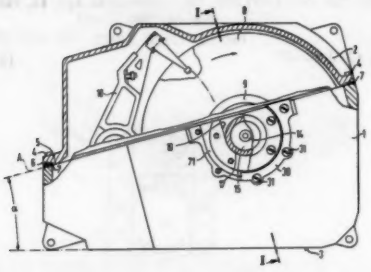
U.S. Cl. 360—97 **7 Claims**

1. In a housing for a magnetic disk drive in which the housing is formed of a support shell and a cover each having a peripheral edge for mating with the peripheral edge of the other at a parting plane and in which the support shell has a pair of parallel lateral walls each connected to a respective one

of a pair of end bearing of a magnetic disk pack, and in which one of the lateral walls includes a slot opening through the peripheral edge of the support shell for receiving one of said bearing means, the improvement therein comprising:

a sealing ring disposed between said peripheral edges, said sealing ring comprising a first portion shaped complementary to the peripheral edges of the support shell and the cover and mounted therebetween and an annular second portion extending generally perpedicular to said first portion for embracing said one of the bearing means which is disposed in the slot; and

means for securing said annular second portion to said one of the lateral walls.



4,692,828

MAGNETIC DISK DRIVE CAPABLE OF MECHANICAL CONNECTION TO A DATA PROCESSING INSTRUMENT WITHOUT DEFORMATION

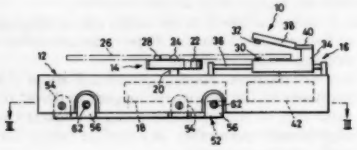
Yasushi Noda, and Toshihiro Kitahara, both of Tokyo, Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,407

Claims priority, application Japan, Jul. 31, 1984, 59-119414[U]

Int. Cl.[4] G11B *17/02*

U.S. Cl. 360—97 **3 Claims**



1. A magnetic disk drive to be mounted between a pair of disk drive holder plates of data processing equipment, the disk drive including a base structure having mounted thereon a disk drive mechanism and a head transport mechanism, wherein the improvement resides in connector means through which the base structure is to be fastened to the disk drive holder plates of the data processing equipment, the connector means comprising a pair of metal made connectors disposed one on each side of the base structure, each connector having an elongated connective strip secured to the base structure, and a pair of connector lugs formed adjacent both ends of the connective strip in one piece therewith and protruding therefrom each connector lug having defined therein a hole for receiving a fastener element for fastening the base structure to the disk drive holder plates, the connector lugs being less in rigidity than the disk drive holder plates and the base structure so that the connector lugs are deformable, when the fastener elements are inserted in their holes for mounting the base structure to the disk drive holder plates, to take up possible positional errors between the base structure and the disk drive holder plates and hence to protect the base structure from deformation.

4,692,829

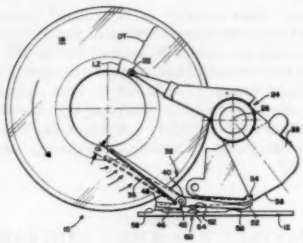
MAGNETICALLY BIASED AERODYNAMICALLY RELEASED INTEGRAL SAFETY LATCH FOR RIGID DISK DRIVE

Steve G. Campbell, San Jose, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Sep. 13, 1985, Ser. No. 775,840

Int. Cl.[4] G11B *5/54, 21/22*

U.S. Cl. 360—105 **9 Claims**



1. In a data storage device including a frame and a plurality of rigid rotatable disks, at last one of which provides a data storage surface for storage and retrieval of useful data, at least one moveable data transducer for reading and writing data from and to selectable concentric data tracks of said data storage surface, said transducer adapted for flying in close non-contacting proximity to said data storage surface upon an air cushion provided during disk rotation, there being a landing zone for the transducer on the surface during non-rotation of the disks, and there being a carriage for moving the transducer from the landing zone to any one of the selectable data tracks during operation of the device,

an improved safety latch for locking the transducer carriage to restrain the transducer to the landing zone during non-rotation of the disks and for releasing the carriage in response to airflow generated by disk rotation, the latch including moveable airvane means disposed between two disks for being deflected means responsive to deflection of the airvane means to release the carriage, and the carriage including engagement means for enabling locking engagement by the safety latch during disk non-rotation and release by the safety latch in response to airflow so that the transducer may thereafter be moved to the data tracks,

the safety latch further including magnetic bias spring means for providing a predetermined bias force by repulsion of oppositely facing, like magnetic poles to the safety latch in order to urge the safety latch into engagement with the carriage in the absence of airflow sufficient ot deflect the airvane means to overcome the bias and thereby release the safety latch.

4,692,830

CLEANING CASSETTE FOR HIGH SPEED CASSETTE RECORDERS INCLUDING MANUALLY OPERABLE DRIVE MEANS

Ulrich Willburger, Auf der Schuchen 27, 8110 Seehausen, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 623,147

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 8318007[U]

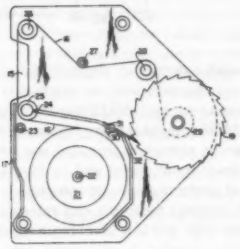
Int. Cl.[4] G11B *5/10, 5/127, 5/41*

U.S. Cl. 360—128 **14 Claims**

1. A cleaning cassette for a high speed cassette recorder, comprising:

a cassette case dimensioned to correspond to a magnetic tape cassette operative in the cassette recorder, the cassette case having means preventing the cassette recorder from detecting presence of the cleaning cassette in an operative position of the cassette case, whereby the cassette recorder is inoperative when the cleaning cassette is inserted and operatively movable parts of the cassette recorder are stationary;

a cleaning tape guided in the cassette case, the cleaning tape being dispensed from a supply reel to a take-up reel, the cleaning tape being guided in the cassette case along a path corresponding to an operative path of a magnetic tape in the magnetic tape cassette, and the cleaning tape being movable over a stationary magnetic head of the cassette recorder, the tape having a configuration similar to the magnetic tape in the area of the magnetic head; and



a manually-operable drive means for manual transfer of the cleaning tape from the supply reel over the stationary magnetic head to the take-up reel during cleaning, the manually operable drive means being readily accessible for manual operation to advance the tape over the stationary magnetic head when the cleaning cassette is inserted in the operative position, the cassette recorder detecting presence of a cassette by contact with an area of a case thereof, the cassette case of the cleaning cassette being indented at the area of contact;

whereby full speed operation of the cassette recorder is precluded when the cleaning cassette is in the operative position and manual advancement of the cleaning tape over the stationary magnetic head occurs in a manner identical to cassette operation except at a slower speed.

4,692,831

DISC CARTRIDGE HAVING POSITIVE ISOLATION MEANS WHEN IN STORAGE

Katsuhiro Suzuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,583

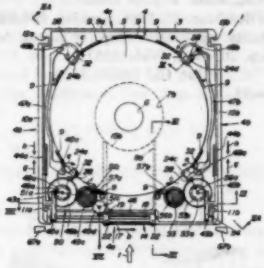
Claims priority, application Japan, Sep. 12, 1984, 59-191339

Int. Cl.[4] G11B *23/02, 19/00*

U.S. Cl. 360—133 **26 Claims**

1. A disc cartridge for use with a disc player, comprising a case assembly (**4**) and an information recording disc (**5**) rotatably housed in said case assembly, which is characterized by a disc holding mechanism which is constructed in such an arrangement that when said disc cartridge is not in use, said disc holding mechanism holds said disc keeping the same away from the inner periphery of said case assembly and when said disc cartridge is in use with said disc player, said disc holding mechanism releases said disc complete for free rotation of the same, a plurality of disc supporting members (**24***a*, **24***b*, **24***c*, **24***d*) arranged in said case assembly, each having both a disc holding position wherein each said disc supporting member contacts and positively holds the periphery (**5***a*) of said disc away from said case assembly and a disc releasing position wherein said disc supporting member releases the disc;

biasing means (**57***a*, **57***b*) for biasing each of said disc supporting members to assume said disc holding position; and



an actutating means (**43***a*, **50**), (**43***b*, **54**) for forcing each of said disc supporting members to assume said disc releasing position against the force of said biasing means when said disc cartridge is thrusted into said disc player.

4,692,832

METHOD FOR LOWERING THE FRICTIONAL COEFFICIENT OF THE MAGNETIC HEAD-DISK INTERFACE IN A LUBRICATED MAGNETIC DISK STORAGE SYSTEM

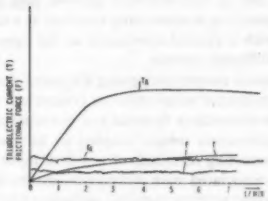
Upali Bandara, Stuttgart, and Holger Hinkel, Boblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,646

Claims priority, application European Pat. Off., Aug. 6, 1985, 85109846.7

Int. Cl.[4] G11B *21/02, 5/55*

U.S. Cl. 360—137 **5 Claims**



1. A method for lowering the frictional coefficient of the magnetic head-disk interface in a magnetic disk storage system of the type having at least one magnetic disk with data tracks and a lubricated surface and at least one magnetic head mounted on a slider, the slider being supported on an air cushion formed between an air bearing surface of the slider and the rotating disk surface during operation of the system and being in contact with the disk surface during sliding phases at starting and stopping of the system, the method comprising the steps of:

rotating the disk at a rotational velocity lower than normal operational velocity so that the slider slides in contact on its associated disk surface, the disk rotation being performed in an atmosphere of gas at relatively low humidity; and

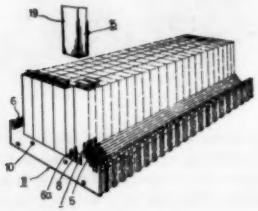
moving the slider over all tracks of the disk during rotation of the disk, so that the complete recording surface of the disk is conditioned by the slider.

4,692,833

SAFETY DEVICE FOR COMMUNICATION EQUIPMENT

Ki Ho Chung, Seoul, Rep. of Korea, assignor to Samhwa Electric Industrial Co., Seoul, Rep. of Korea

Filed Mar. 27, 1986, Ser. No. 844,548
Claims priority, application Rep. of Korea, May 11, 1985, 1985-5469; Sep. 26, 1985, 1985-12567
Int. Cl.[4] H02H 3/20
U.S. Cl. 361—91 12 Claims



1. A safety device for protecting communications equipment that is coupled to a communications line, comprising

a plurality of substantially identical base stand units adapted to be held in side-by-side relationship to form a terminal stand, each base stand unit being associated with a respective group of communication lines,

a plurality of terminal inserting grooves on a face of each base stand unit,

input and output terminals, ground terminals and connecting terminals inserted into the ends of said grooves in the base stand units,

rigid communicating bars in said grooves for conductively connecting an input terminal at one end of a groove with a connecting terminal at the opposite end of the groove, for conductively connecting an output terminal at one end of a different groove with a connecting terminal at the opposite end of that different groove, and for conductively connecting a connecting terminal at a still different groove with a ground conductor at the opposite end of said still different groove,

safety connector means comprising a housing that includes a ground conductor adapted to be connected to a ground conductor connecting terminal and overcurrent and overvoltage protection means adapted to be connected between connecting terminals of a pair of input and output terminals associated with a communications line,

said overcurrent protection means including first and second elongated switch elements, at least one of which is a bimetal element that operates to close said switch elements together when it is heated beyond a predetermined temperature,

means connecting said switch elements to said ground conductor when the switch elements close,

a heating means closely adjacent said bimetal element and adapted to be connected in circuit between the input and output terminals associated with a given communications line, whereby an overcurrent on said communication line heats the heating means to close said switch elements and connect the communications line to ground,

said overvoltage protection means responding to voltages on said communications line that exceed a predetermined magnitude to connect the communication line to ground,

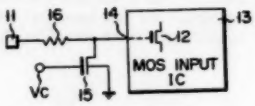
said overcurrent and overvoltage protection means automatically returning to an initial, operative condition that disconnects the ground connection after the overcurrent or overvoltage ceases.

4,692,834

ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT WITH VARIABLE LIMITING THRESHOLD FOR MOS DEVICE

Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo, and Akira Narita, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tosbac Computer System Co., Ltd., Tokyo, both of, Japan

Filed Aug. 2, 1985, Ser. No. 761,707
Claims priority, application Japan, Aug. 20, 1984, 59-172559
Int. Cl.[4] H02H 3/20
U.S. Cl. 361—91 12 Claims



1. A variable-threshold electrostatic discharge protection circuit in combination with an associated semiconductor device containing an input MOS transistor having an input gate, said input MOS transistor being operative from a power source potential and a reference potential and being responsive to a reference level input signal and to high and low level input signals, said protection circuit comprising:

an input terminal receiving said reference level input signal and said high and low level input signals, said input terminal being coupled to said input gate of said input MOS transistor of said associated semiconductor device; and

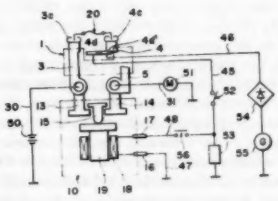
a gate-controlled MOS diode connected between said input gate of said input MOS transistor of said associated semiconductor device and said reference potential of said input MOS transistor for limiting at a variable threshold the voltage applied to said input gate of said MOS input transistor, said diode having a control gate and being responsive to a given threshold control potential applied to said control gate to increase said variable threshold to limit the voltage at said input terminal to a value above said high level input signal when said high level input signal is applied to said input terminal.

4,692,835

FUSE CIRCUIT UNIT FOR COMBINATION WITH AN ELECTROMAGNETIC SWITCH

Syohati Setoguti; Yoshiteru Nakatake, both of Miyazaki; Mitsuru Uehara, Kawagoe, and Masayuki Kudou, Shiki, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo and Honda Manufacturing Co., Ltd., Miyazaki, both of, Japan

Filed Sep. 26, 1985, Ser. No. 780,395
Claims priority, application Japan, Oct. 3, 1984, 59-206297; Oct. 3, 1984, 59-148966[U]; Oct. 9, 1984, 59-210495
Int. Cl.[4] H02H 5/04
U.S. Cl. 361—104 9 Claims



1. The combination of a fuse circuit unit and an electromagnetic switch,

said electromagnetic switch having an input terminal which connects to a power supply means; an output terminal

which connects to a first load circuit; and a closed switch casing; and

said fuse circuit unit comprising:

a first terminal member having one end thereof which is connectable to one terminal of a main fuse of a second load circuit, and another end which is connectable to said input terminal of said electromagnetic switch and to said power supply means;

a second terminal member having one end thereof which is connectable to another terminal of said fuse, and another end which is connectable to said second load circuit;

a casing supporting said first and second terminal members;

engaging means provided on said casing of said fuse circuit unit for mechanical engagement with engaging means provided on said electromagnetic switch; and

fastening means for removably fastening said first terminal member to said input terminal of said electromagnetic switch to mechanically and electrically connect said fuse circuit unit and said electromagnetic switch together;

said engaging means and said fastening means cooperatively mechanically and electrically interconnecting said fuse circuit unit and said electromagnetic switch together such that said first load circuit is fed from said power supply means via said input and output terminals of said electromagnetic switch, and said second load circuit is fed from said power supply means via said first and second terminals of said main fuse, said fuse circuit unit and said electromagnetic switch being independently operable.

4,692,836

ELECTROSTATIC CHUCKS

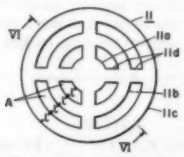
Yoshio Suzuki, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,408

Claims priority, application Japan, Oct. 31, 1983, 58-204239; Oct. 31, 1983, 58-204240; Oct. 31, 1983, 58-204241

Int. Cl.[4] H01T *20/00*

U.S. Cl. 361—234 **9 Claims**



1. In an electrostatic chuck of the type wherein an electrode is covered by an insulating dielectric member, an object to be electrostatically attracted is mounted on said dielectric member and a potential difference is applied across said object and said electrode,

the improvement wherein said electrode is constituted by a solid electroconductive portion and an intangible portion which are arranged so as to make non-uniform a distribution of an electrostatic attractive force applied to said object, wherein said solid electroconductive portion of said electrode comprises a central portion and a plurality of radially spaced annular portions concentric therewith, and wherein said central portion and said annular portions are electrically interconnected by a plurality of circumferentially spaced radially extending electroconductive members.

4,692,837

COEXTRUDED, BIAXIALLY ORIENTED, MULTI-LAYER AND CAPACITOR MADE THEREFROM

Guenther Crass, Taunusstein; Lothar Bothe, Mainz-Gonsenheim, and Gunter Schloegl, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 929,287

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540214

Int. Cl.[4] H01G *4/04, 4/22*

U.S. Cl. 361—313 **22 Claims**

1. A coextruded, biaxially oriented, multi-layer film comprising:

a base layer and

two outer layers on either side of said base layer, said base layer and said two outer layers including a high-purity electrical insulation plastic film material, having a maximum residual ash content of less than about 100 ppm, and a stabilizer,

wherein the ratio of the amount of said stabilizer present in said two outer layers and the amount of said stabilizer present in said base layer lies within the range from about 3:1 to about 10:1.

4,692,838

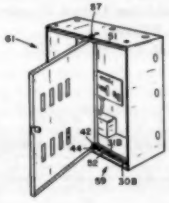
FIRE PANEL WITH DOOR PROVIDING EASE OF SERVICE

David E. Merchant, Lincoln, Nebr., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jul. 7, 1986, Ser. No. 882,398

Int. Cl.[4] H05K *5/00*

U.S. Cl. 361—380 **7 Claims**



1. A fire panel comprising:

a housing having an opening;

fire panel electronics within said housing;

a door closing said opening in said housing; and

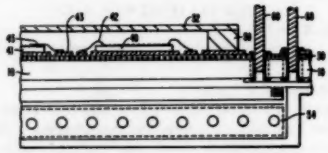
attaching means attaching said door to said housing while permitting said door to be pivoted about one end and permitting the pivoted end of said door to be moved from one side of said opening to the opposite side without detaching it from said housing, said attaching means including means permitting the pivoted end of said door to be detached from said housing when said pivoted end is located in at least one location away from the side of said opening where said pivoted end is located when said door is closed, while preventing said pivoted end from being detached from said housing when said door is closed.

4,692,839

MULTIPLE CHIP INTERCONNECTION SYSTEM AND PACKAGE

James C. K. Lee, Los Altos; Richard L. Beck, Cupertino, and Francisca Tung, Los Gatos, all of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 24, 1985, Ser. No. 748,087
Int. Cl.[4] H05K 7/20; H01L 23/12
U.S. Cl. 361—386 15 Claims



1. A module for interconnecting integrated circuits comprising:

a thermally-conductive substrate having a first surface;

a first layer of electrically-insulating material disposed across the first surface;

at least one layer of electrical interconnections disposed on the layer of electrically-insulating material;

a second layer of electrically-insulating material disposed across the at least one layer of electrical interconnections and including openings therethrough to selected portions of the at least one layer of electrical interconnections;

an upper layer of electrical interconnections disposed over the second layer electrically-insulating material and extending through the openings to contact selected portions of the at least one layer;

a plurality of integrated circuits attached to the upper layer; and

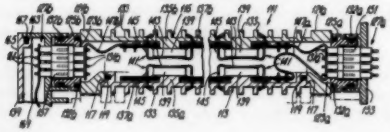
means for electrically connecting the integrated circuits to the upper layer.

4,692,840

ELECTRIC CIRCUIT MODULE ARRANGEMENTS

Stafford M. Ellis, East Preston, England, assignor to GEC Avionics Limited, England

Filed Mar. 6, 1986, Ser. No. 836,988
Claims priority, application United Kingdom, Mar. 29, 1985, 8508278; Apr. 4, 1985, 8508941
Int. Cl.[4] H05K 7/00
U.S. Cl. 361—393 20 Claims



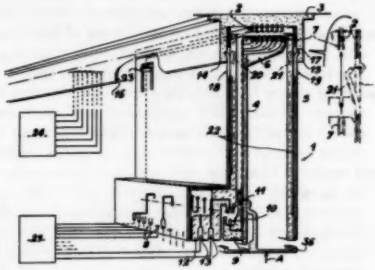
1. An electric circuit module arrangement adapted for mounting in racking comprising: a plurality of electric circuit modules secured together in side by side relationship; a plurality of first electric connector parts respectively secured to individual ones of said modules at corresponding ends thereof; a plurality of second electric connector parts, complementary to said first connector parts, and respectively mated with said first connector parts; a wiring arrangement connected with said second connector parts thereby to provide electrical interconnections between said modules; and at least one third electric connector part, mounted on a said module at the opposite end to the first connector part secured to that module, via which electrical connections between the module arrangement and electric circuits external of the module arrangement may be made.

4,692,841

ELECTRONIC MODULE THAT CAN BE PLUGGED INTO A BUS CONNECTOR

Alain Andrieux, Lessarts; Yves Trequilly, Meudon, and Jean-Claude Lavoine, Montrouge, all of France, assignors to CGEE Alsthom Direction Red, Societe Anonyme, Clamart, France

Filed Mar. 31, 1986, Ser. No. 846,002
Claims priority, application France, Apr. 2, 1985, 85 04978
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—395 4 Claims



1. A connecting unit comprising:

a U-shaped support base, a bus connector locked with the support base and adapted to be electrically connected to a bus, an electric module plugged into the bus connector,

said module comprising a housing engaged in the support base and containing a printed circuit board having mounted thereon electric components,

an auxiliary connector connected to the circuit board and adapted to connect the circuit board to outside wiring,

said support base being a U-shaped elongated element defined by a bottom portion integrally connected to opposed wings extending from opposite sides of the bottom portion, said bus connector comprising parallel conductive strips insulated from one another and insulated from the support base, said parallel conductive strips located at the bottom portion of the U-shaped support base, the two wings of the support base each having opposed grooves facing each other parallel to the bottom of the U-shaped portion, and

said housing comprising locking means for engaging the grooves of the opposed wings of the U-shaped base so that the housing and support base are locked together.

4,692,842

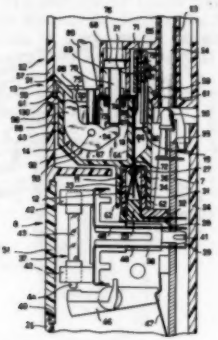
INPUT/OUTPUT DEVICE FOR AN APPARATUS OF THE PROGRAMMABLE AUTO-CONTROL TYPE, A RANGE OF SUCH DEVICES

Jean Joly, Houilles, and Yves Oehlert, Rueil; Jean Neyroud, Domaines; Olivier Penot, Antibes; Jacky Pergent, Carros; Gilbert Barillier, Gattieres; Bernard Le Blanc, Biot all of France, assignors to La Telemecanique Electrique, Nanterre, France

PCT No. PCT/FR84/00093, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04223, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 6, 1984, Ser. No. 691,487
Claims priority, application France, Apr. 15, 1983, 83 06175
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—413 5 Claims

1. An apparatus for controlling an automatic installation, said apparatus comprising a plurality of cards (7) each supporting a plurality of electronic channels (17, 23) for processing and transmitting signals exchanged between a bus (103) and equipment incorporating both sensors (16) detecting an operat-

ing condition of said installation and actuators (22) to which output control signals are delivered, each card (7) being connected to a control unit through the bus (103) and to a terminal box (13), each card being contained in a housing (8) which is slidably inserted in a container (1), wherein each terminal box (13) comprises a portion (58) which is removably inserted in a



front aperture (112) of said housing (8), and which when inserted therein engages at least one latch (117) displaceably carried by the housing (8), and wherein upon insertion said latch is in a position wherein said latch further engages a retriever portion (119) of the container (1) so as to lock the housing (8) in a position of insertion in the container (1).

4,692,843

MULTILAYER PRINTED WIRING BOARD

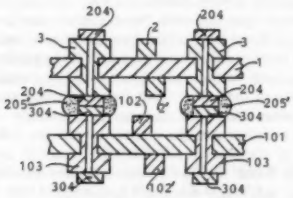
Masaru Matsumoto, Yamato; Mikio Nishihara, Tokyo, and Kiyoshi Kuwabara, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,819

Claims priority, application Japan, Nov. 19, 1985, 60-176877[U]

Int. Cl.[4] H05K *1/14*

U.S. Cl. 361—414 **2 Claims**



1. A multilayer printed wiring board comprising:

a plurality of printed wiring boards each comprising a board and a plurality of conductor patterns provided onto said board;

a plurality of through-hole pads each made of electric conductor material, provided onto said board so as to pass through said board, arranged at the same position on said board as those on other said boards, having the same height from a surface of said board as those of other said pads on said board, and having an end face at both ends of said pad having the same size respectively as those of other said pads on said board and on other said boards;

a plurality of air gaps each provided between said printed wiring boards being adjacent to each other, for providing a designated space between surfaces of said conductor patterns provided respectively onto said printed wiring boards being adjacent to each other;

a plurality of spacers each made of electric conductor material, provided onto said both end faces of each said through-hole pad, joined to another said spacer provided to opposite said through-hole pad, having a thickness being adequate for providing said air gap, and having an end face having size being smaller than a size of said end face of said through-hole pad for providing a drop part around a periphery of said spacer looking from a side surface of said through-hole pad; and

solder which stays at each said drop part for joining said spacers and said through-hole pads, which are opposite to each other respectively, of said printed wiring boards being adjacent to each other.

4,692,844

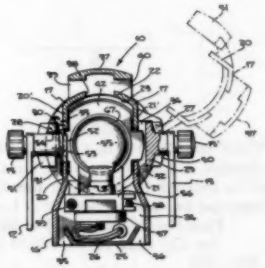
ADJUSTABLE LIGHT PROJECTOR

Jean Galerne, Guerville, France, assignor to LTM Corporation of America, Hollywood, Calif.

Filed Jul. 12, 1985, Ser. No. 754,166

Int. Cl.[4] F21V *19/02, 29/00*

U.S. Cl. 362—3 **11 Claims**



1. An adjustable light projector comprising a housing having side walls, a rear wall and front wall forming a chamber, an opening in the front wall for emission of light and means at the opening for mounting a lens, a carriage having a lamp socket, support means in the chamber extending between the front and rear walls, said carriage having a movable mounting on the support means and adjusting means between the carriage and the housing for shifting the position of the carriage relative to the front wall, a lower stationary section of said housing comprising portions of said side walls and an upper section comprising remaining portions of said side walls, there being a movable connection between the upper section and the stationary section on one side of the housing and a releasable connection on an opposite side of the housing whereby to provide access to said chamber, said remaining portions of said side walls forming in part said upper section of the housing being spaced from said portions of said side walls forming in part said lower stationary section thereby forming vents.

4,692,845

FLIP-OVER LAMP BRACKET FOR VEHICLES

Michael J. Widhalm, 16900 Yolite St., NW., Anoka, Minn. 55303, and Thomas G. Widhalm, 1322 119th La., Coon Rapids, Minn. 55433

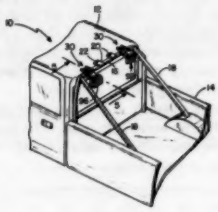
Filed Apr. 11, 1986, Ser. No. 850,823

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 362—80 **6 Claims**

1. In combination with a vehicle having a roll bar, a flip-over auxiliary lamp bracket comprising first horizontal base means attached to a portion of said roll bar, second base means, an auxiliary lamp mounted on one side of said second base means, means for hingedly connecting one end of said first means to one end of said second means, and over-center springe means

for retaining said second means in either an overlapping, generally parallel, relationship in which said one side of said second base means is uppermost with said auxiliary lamp facing forwardly of the vehicle and in which the then underside of said



second base means bears against the upper side of said first base means or in an extended, substantially straight line, relationship with said first means in which said one side of said second means is lowermost and said auxiliary lamp faces rearwardly of said vehicle.

4,692,846

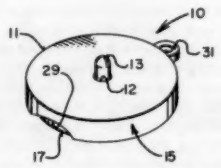
BATTERY HOLDER FOR COIN TYPE BATTERIES

Randall Johnson, 222 Avery La., No. 3, Los Gatos, Calif. 95030, assignor to Deborah Donkerbrook; Ronald Carstersen; Gail Carstersen and Randall Johnson, all of Los Gatos, Calif.

Filed Sep. 2, 1986, Ser. No. 902,612

Int. Cl.[4] F21L *15/08*; H01M *2/10*

U.S. Cl. 362—104 **5 Claims**



1. A battery holder for use with a coin type battery comprising a cup-shaped receptacle for receiving a coin-type battery, said receptacle having a wall and an annular rim protruding substantially normally away from one side face of said wall, a socket formed in said wall adapted to hold an electric device therein of a type having first and second leads coupled thereto, said leads having a predetermined diameter, a slot formed in said one side face to extend radially from said socket to said rim, said slot continuing substantially normal to said one side face in the inner surface of said rim, said radial slot having a depth substantially equal to or greater than said predetermined diameter, said first lead lying in said radial slot and in the slot continuing in the inner surface of said rim, said continuing slot having a depth substantially less than said predetermined diameter to cause a lead therein to be forced against the edge of a coin-type battery disposed within said socket, a layer of insulation covering that portion of said first lead lying in said one side face while leaving exposed that portion of said first lead continuing in the slot in the inner surface of said rim, said second lead lying exposed against said one side face of said wall whereby insertion of a coin type battery into said receptacle causes positive and negative portions of the battery to contact the exposed portions of said first and second leads.

4,692,847

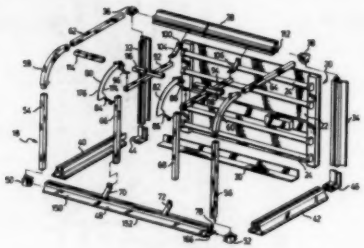
ILLUMINATED AWNING ASSEMBLY

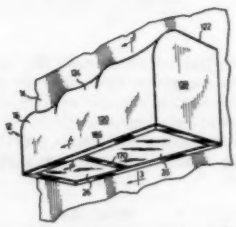
James Gandy, Mississauga, Canada, assignor to Signtech Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 761,286, Aug. 1, 1985, abandoned. This application Aug. 27, 1985, Ser. No. 769,825

Int. Cl.[4] F21S *1/02*

U.S. Cl. 362—152 **21 Claims**





1. An illuminated awning assembly comprising a frame having:

an upright rear frame portion having upper and lower frame members and a pair of upright side members extending between respective opposite ends of the upper and lower frame members,

a horizontal frame portion having a pair of horizontal side members extending forwardly from respective junctions of the rear lower frame member and the upright side members, and a lower front frame member extending between front ends of the horizontal side members,

a pair of further side frame members on opposite ends of the frame, each further side frame member extending from a junction of the lower front frame member and respective horizontal side frame member to a junction of the upper frame member and the respective upright side member,

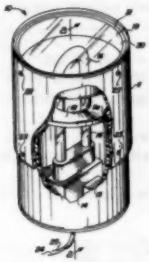
a sheet of translucent flexible sign material extending upwardly from the lower front frame member over the further side frame members to the upper rear frame member, and extending from the further side frame members to the horizontal side members and to the rear upright side members,

the lower front frame member, the upper rear frame member, the horizontal side members and the rear upright side members each having a series of adjustable sheet tensioning devices spaced along their length, each tensioning device comprising sheet retaining means gripping an edge portion of the sign sheet and means for adjusting the position of the gripping means relative to the member to tension the sign sheet between the respective members,

the lower front frame member, the upper rear frame member, the horizontal side members and the rear upright side members each having a flange with a free end over which the sign sheet passes and a recess in which the sheet tensioning devices are located, each tensioning device being positioned to cause the sign sheet to turn through an angle

of over 90 degrees as the sign sheet passes over the respective frame flange free end, and
illuminating means located within the frame.

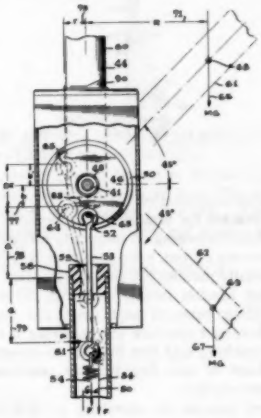
4,692,848
OUTDOOR LIGHTING FIXTURE WITH U-SHAPED FLUORESCENT LAMP
David D. Poyer, 858 Roseway St., Naples, Fla. 33942
Filed Jul. 15, 1986, Ser. No. 885,674
Int. Cl.[4] F21S *5/00*; F21V *21/00*
U.S. Cl. 362—216 **6 Claims**



1. A fluorescent lighting fixture designed for outdoor use comprising:
- a cylindrical housing of polyvinyl chloride and having an upper end, a lower end, generally concentric inner and outer walls, and an annular ring projecting inwardly from its inner walls;
- a cylindrical housing extension made of polyvinyl chloride and having upper and lower ends, generally concentric inner and outer walls and an outer diameter slightly less than the inner diameter of the housing, said extension being fitted into the lower end of said housing;
- a generally flat circular base plate made of thermoplastic material sized to fit snugly into the lower end of the housing extension;
- a fluorescent lamp assembly consisting of a U-shaped fluorescent lamp, a socket for said lamp, and a 120 volt transformer wired in series, the socket and the transformer being mounted on the upper surface of said base plate;
- a circular mirror-surfaced reflector surrounding the lower end of the fluorescent lamp and secured against the annular ring of said housing; and
- a flat circular transparent lens bonded to the upper end of said housing.

4,692,849
HEAT FREE EXAMINATION LIGHT WITH FULLY ROTATABLE HEAD AND ARM
Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356
Filed Aug. 16, 1985, Ser. No. 766,572
Int. Cl.[4] F21V *21/18*
U.S. Cl. 362—402 **5 Claims**

1. An examination light comprising:
- a base support means which has four horizontal projections placed at right angles to each other to provide stability; affixed to the underside and at the distal end of each is a castered wheel to enable the light to be rolled across a floor; superior to the horizontal projections and rigidly attached thereto is a case means for enclosing electrical power conversion means and for providing a support and rotation means for the structures of the light, which are:
- a shaft means projecting vertically from the base means,
- a housing means attached to the upper end of the vertical shaft means,
- a counterbalance means within the housing means for balancing a moveable arm exterior to the housing means comprising:
- a horizontal shaft supported within the housing means, mounted on bearings located in opposing walls of the housing means with one end projecting through one wall to the outside of the housing means and to which is rigidly affixed to that end an arm means, and,
- a metal disc within the housing means rigidly affixed to the shaft close to one wall of the housing means; located on the disc and projecting away from the nearby wall is a pin perpendicular to the plane of the disc,
- a fiber plate through which the horizontal shaft passes located between the metal disc and the nearby wall of the housing means,
- a compression spring through which the horizontal shaft passes located betwen the metal disc and the far wall of the housing means, terminating in a bearing washer against the housing means, such that the compression spring acting against the housing means reacts against the metal disc causing the horizontal shaft to displace along its axis until the metal disc impinges on the fiber plate thereby compressing the fiber plate between the metal disc and the nearby wall of the housing means, and establishing a frictional resistance to any rotation of the metal disc,



- a rod means extending from the projecting pin on the metal disc in a direction away from the orizontal shaft and passing through a ferrule, said ferrule being rigidly fixed with the housing means, said ferrule limiting the lateral travel of the rod means, said rod means presenting a loop on each end, one end for encircling the pin and providing an attachment with pivoting freedom as the metal disc is rotated, and the other end for attaching to an extension spring,
- an extension spring attached to the end of the rod away from the metal disc and the ferrule, pre-extended a determined distance between the rod and an attachment and adjustment means rigid with the housing means, to apply a counterforce opposing the force imposed by the arm means for any position of the arm means; said counterforce being the product of the direct tension of the extension spring on the pin as it is applied to the off-center position of the pin on the disc, and to the side force against the pin on the disc caused by the restrictive effect of the ferrule against the rod preventing a lateral displacement of the rod for the off-center position of the pin,
- a moveable arm means pivoted and supported from a horizontal shaft extending from the housing means,
- a lamp head means affixed and pivoted on the distal end of the moveable arm means,
- a light source within the lamp means,

an optical means within the lamp head means for directing the light from the lamp head in the form of an optical beam, and,

a heat rejection means within the lamp head means that separates the heat from the light, and,

a means that dissipates the heat rejected from the light within the lamp head means to the surrounding atmosphere.

4,692,850

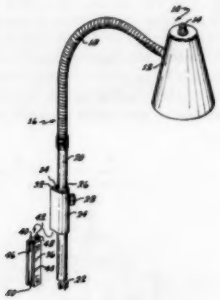
LAMP FOR TEMPORARILY ATTACHING TO A SUPPORT

John P. LeDoux, 1509 Old Fashion Way, Anaheim, Calif. 92804

Filed Dec. 30, 1985, Ser. No. 814,329

Int. Cl.[4] F21S *1/02*

U.S. Cl. 362—432 **11 Claims**



1. A lamp consisting of

a first bracket for attaching to a support surface, said first bracket comprising an integrally formed elongated member having a front, a flat planar back, a top, a bottom, and essentially parallel left and right sides;

said first bracket further including at least one aperture extending between said front and back of said first bracket, said aperture for receiving a fastening member for attaching said first bracket to a support surface with the back of said first bracket positioned towards said support surface;

a second bracket for attaching to said first bracket, said second bracket being elongated and including at least a back, a top, a bottom, and essentially parallel left and right side edges;

one of said first bracket and said second bracket including first and second elongated grooves formed on one of said first and said second brackets, said first and said second elongated grooves located essentially parallel to one another and spaced apart from one another and oriented with respect to one another so as to open opposed to one another;

the other of said first and said second brackets including first and second elongated ribs, said first and said second elongated ribs located essentially parallel to one another and sized and shaped and positioned on the other of said first and said second brackets in a spaced relationship such that said first elongated rib fits into said first groove and said second elongated rib fits into said second groove to mate said second bracket to said first bracket;

limiting means located on one of said first and said second brackets for maintaining said second bracket mated to said first bracket to temporarily attach said second bracket to said first bracket;

an elongated lamp neck having ends, said lamp neck being hollow;

an electric light attaching to one of said ends of said lamp neck and including electrical wiring attaching to said electric light and passing through said hollow lamp neck and exiting out of the other of said ends of said hollow neck;

said second bracket including an elongated hollow cylindrical opening in said second bracket, said opening extending between the top and bottom of said second bracket, said neck opening sized and shaped to accept at least a portion of said elongated lamp neck in said opening;

said elongated lamp neck operatively attaching to said second bracket proximal to said other of said ends of said neck by fitting into said elongated hollow cylindrical opening in said second bracket whereby said neck and said lamp attached therto are supported by said second bracket which in turn is supported on said first bracket which is in turn supported on a support surface.

4,692,851

HARMONIC-RESONANT POWER SUPPLY

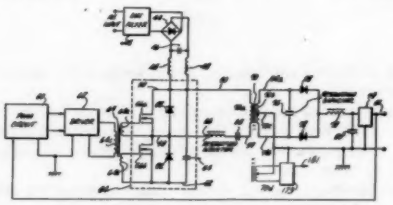
Brian E. Attwood, Sestri, 49 Smithbarn, Horsham, Sussex, England

Filed Mar. 4, 1985, Ser. No. 708,011

Claims priority, application United Kingdom, Feb. 2, 1985, 8502689

Int. Cl.[4] H02M *3/337*

U.S. Cl. 363—16 **12 Claims**



1. A power supply for producing a main DC output froma DC input comprising:

(a) an isolation transformer having a primary winding and a main secondary winding:

(b) switching means for driving the primary winding from the DC inpui, the switching means being responsive to a switching signal;

(c) means for rectifying and filtering a voltage at the main secondary winding to produce the main DC output;

(d) control means for producing the switching signal to provide pulse-width modulation of the switching means at a fixed frequency in response to changes in the main DC output voltage; and

(e) means for producing resonance in the isolation transformer at a resonant frequency of from about five to about twenty times the fixed frequency during operation of the switching means for preventing electromagnetic interference by the power supply.

4,692,852

SWITCHING POWER SUPPLY WITH RASTER WIDTH STABILIZATION

Alan A. Hoover, New Palestine, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 25, 1986, Ser. No. 878,234

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **35 Claims**

1. A switching power supply for a video display apparatus, comprising:

a source of energy;

a power transformer;

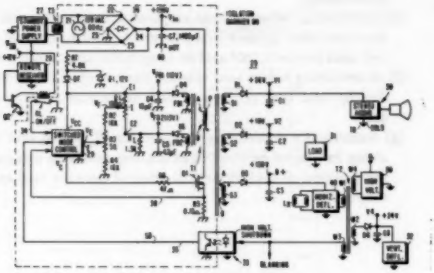
output switching means coupled to a first winding of said transformer and to said source;

a deflection circuit of said video display apparatus coupled as a first load circuit to a second winding of said trans-

former and taking energy from said source for producing a raster;

a first feedback winding of said transformer for developing a first feedback voltage representative of variations in loading on said transformer;

a second feedback winding of said transformer for developing a second feedback voltage representative of variations in loading on said transformer; and



a control circuit coupled to said first and second feedback windings and to said output switching means for controlling the switching thereof in accordance with said first and second feedback voltages to regulate the energy transfer beween said source and said deflection circuit for stabilizing the size of said raster.

4,692,853

CONTROL CIRCUIT FOR A CHOPPED POWER SUPPLY WITH PROGRESSIVE START UP

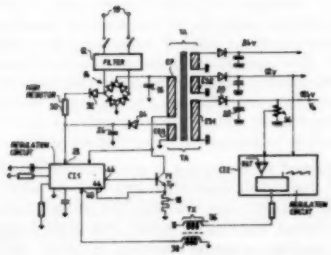
Jean de Sartre, Meylan, and Philippe Maige, Syssinet Pariset, both of France, assignors to Thomson-CSF, Paris, France

Filed Feb. 7, 1986, Ser. No. 826,986

Claims priority, application France, Feb. 8, 1985, 85 01822

Int. Cl.[4] H02P *13/22*

U.S. Cl. 363—49 **7 Claims**



1. A chopped power supply control circuit intended to receive regulation control signals and to produce square waves for enabling a mains switch of the power supply, wherein said square waves having a variable width depending on the signals received, said circuit comprising:

a current limiting circuit including a threshold comparator receiving at one input a signal and at another input a threshold signal;

a means for said comparator to generate a signal for disabling the switch when the threshold is exceeded, in order to ensure gradual start-up of the chopped power supply at the beginning of its operation and in the case of a disturbance of operation;

a means for establishing a variable threshold signals in response to circuit means which

establish a first fixed threshold value under normal established operating conditions,

establish periodically a threshold variation cycle in the opposite case, this cycle comprising

means to cause the threshold to pass to a second value at a time representing the beginning of a periodic threshold variation cycle, the second threshold value corresponding to a lower current in the switch,

means to bring the threshold gradually back from the second value to the first in a first part of the threshold variation cycle,

means for maintaining the threshold at the first value until the end of the current cycle,

means to begin a second start-up cycle again at the end of the current cycle if regulation control signals are still not received at the end of the first cycle,

means for stopping the establishment of threshold variation cycles when regulation control signals are received.

4,692,854

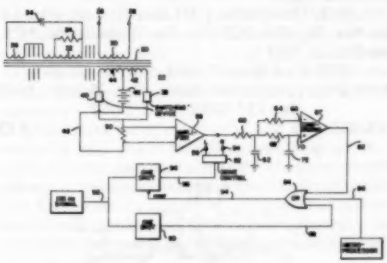
METHOD AND APPARATUS FOR MODULATING INVERTER PULSE WIDTH

Richard V. Baxter, Jr., Appleton; Robert F. Bourke, Fairchild; David R. Ellingson, Tomah; Terrance D. Paul, Port Edwards, and David L. Layden, New Lisbon, all of Wis., assignors to Best Power Technology, Inc, Necedah and Pensar Corporation, Appleton, both of, Wis.

Filed Mar. 4, 1986, Ser. No. 835,950

Int. Cl.[4] H02M *7/00*

U.S. Cl. 363—75 **20 Claims**



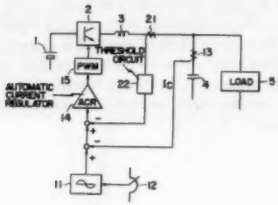
1. In an inverter for use with a ferroresonant transformer for powering an A.C. load from a D.C. source, the inverter having at lesat one current pulse from the D.C. source per A.C. half cycle, said current pulse being variable in width, the ferroresonant transformer having at least one input winding for said D.C. source and an output winding for said A.C. load, the improvement comprising means for detecting when the current flow for said input winding for the inverter-ferroresonant transformer is substantially at zero slope and a low value prior to saturation, and means for terminating the pulse width of the inverter, said means for terminating the pulse width being operated by said means for detecting substantially upon the occcurance of said zero slope and low value of said current prior to saturation, whereby the inverter pulse width is terminated before saturation can occur.

4,692,855

CONSTANT VOLTAGE AND FREQUENCY TYPE PWM INVERTER WITH MINIMUM OUTPUT DISTORTION

Akihiko Kuroiwa, Fuchu, and Suzuo Saito, Higashimurayama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 4, 1986, Ser. No. 903,472
Claims priority, application Japan, Sep. 9, 1985, 60-197572; Jan. 29, 1986, 61-17364
Int. Cl.[4] H02M *7/44*
U.S. Cl. 363—95 6 Claims



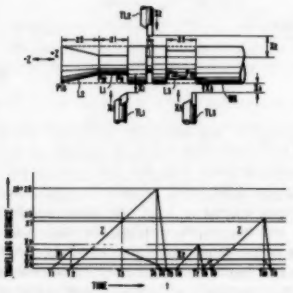
1. An ac power supply device comprising:
a voltage type inverter;
a reactor and a capacitor connected to the output of said inverter;
a circuit for generating a sine wave reference signal;
means for detecting a current flowing through said capacitor; and
means responsive to said sine wave reference signal and said current flowing through said capacitor to control said voltage type inverter in accordance with a compared result thereof.

4,692,856

POSITION CONTROL OF MULTIPLE TOOLS BASED ON ELAPSED TIME OF TOOL OPERATION

Hidetsugu Komiya, Tokyo, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP84/00134, § 371 Date Nov. 28, 1984, § 102(e) Date Nov. 28, 1984, PCT Pub. No. WO84/03956, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 27, 1984, Ser. No. 681,867
Claims priority, application Japan, Mar. 28, 1983, 58-52016
Int. Cl.[4] G05B *19/18, 23/02*
U.S. Cl. 364—167 6 Claims



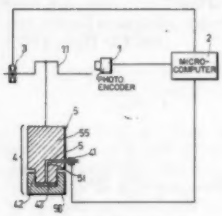
1. A numerical control method for numerically controlling a machine tool having two or more tools, each tool having an axis of movement with respect to a workpiece, comprising the steps of:
(a) creating a time chart representing a relationship between time and position of one of said tools along its associated axis of movement;
(b) creating numerical control data specifying said relationship between time and position of one of said tools along its associated axis of movement;
(c) numerically controlling the position of said tools along each of the axes of movement on the basis of a portion of said numerical control data;
(d) monitoring elapsed time of said numerically controlled positioning;
(e) monitoring whether said elapsed time corresponds to a time specified by said first portion of said numerical control data for each tool and its associated axis of movement;
(f) determining when said elapsed time equals a time specified by said first portion of said numerical control data; and
(g) numerically controlling the position of one of said tools along its axis of movement in accordance with a succeeding position of said numerical control data for said axis of movement.

4,692,857

METHOD AND APPARATUS FOR PROTECTING PRESS FROM BEING DAMAGED BY OVERLOAD CONDITIONS

Charles H. Chi, 218 Chung Hua W. Road, Chang Hua, Taiwan

Filed Jul. 1, 1985, Ser. No. 751,361
Claims priority, application Taiwan, Jun. 18, 1984, 7324604
Int. Cl.[4] G06F *15/46;* G05B *9/02;* B30B *15/28*
U.S. Cl. 364—184 11 Claims

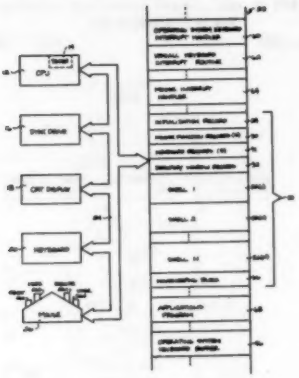


1. A method of protecting a press, which includes a fly wheel, a crank shaft connected with said fly wheel, a ram connected with said crank shaft having hydraluic buffer means mounted therein, and braking means, from being damaged by a pressure overload, a torsion overload, an energy overload, or a power overload, said method comprising the steps of:
(a) detecting an angular displacement of said crank shaft or said fly wheel of said press;
(b) calculation an angular velocity based on said detected angular displacement;
(c) calculating a pressure load value, a torsion load value, an energy load value, and a power load value based on said calculated angular velocity;
(d) respectively determining whether said calculated load values exceed their respective permitted safe load limits; and
(e) generating an overload signal sent to said braking means to actuate it to brake said press, and to said hydraulic buffer means to release said hydraulic buffer means when at least one of said calculated values exceeds its permitted safe load limit.

4,692,858
VISUAL INTERFACE BETWEEN USER AND COMPUTER SYSTEM

Peter M. Redford, and Rita A. Redford, both of Los Gatos, Calif., assignors to Trillian Computer Corporation, Los Gatos, Calif.

Filed Feb. 2, 1984, Ser. No. 576,535
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **12 Claims**



1. A method for providing visual mediation between a computer operating system and a user, said operating system being associated with a computer of the type including a processor, a memory, a display and means for displaying a cursor at a selected disposition on said display, said method comprising the steps of:

selectively forming, on said display, indicia of at least one overlay window containing, at predetermined dispositions therein, display indicia of at least one user determinable task assocaited with said overlay window, said task corresponding to an operation by said computer, said selectively forming step comprising the steps of:

developing, for each overlay window, window definition datum corresponding to said overlay window, said window deifinition datum including, with respect to each assocaited task, task designation datum designating at least one task, and a task definition code string representing a predetermined operation by said computer;

determining the number of task associated with said overlay window;

determining, from said determined number of assocaited tasks, an appropriate geometry for said overlay window and relative dispositions of said display indicia of said tasks in said overlay window;

developing, from said window definition datum, a window definition block corresponding to said overlay window, said window definition block including at least one task definition record corresponding to each associated task, said task definition record including indicia of said task designation datum, indicia of the realtive disposition of the task display indicia in said overlay window, and indicia of said task definition code string; and

storing said window definition block in said memory;

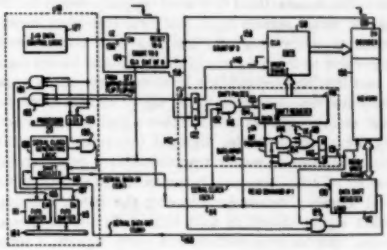
sensing correspondence of the relative disposition of said cursor on said display and the relative dispositions of said task display indicia; and

selectively effecting a predetermined operation by said computer in accordance with the task definition of the task having display indicia at a disposition on said display corresponding to the disposition on said display of said cursor.

4,692,859
MULTIPLE BYTE SERIAL DATA TRANSFER PROTOCOL

Russell G. Ott, Cranford, N.J., assignor to RCA Corporation, Somerville, N.J.

Filed May 16, 1983, Ser. No. 495,115
Int. Cl.[4] G06F *15/00, 12/06*
U.S. Cl. 364—200 **3 Claims**



1. In a data processing system comprising a central processing unit (CPU), a random access memory (RAM) having a memory address terminal for receiving memory address signals and having a data terminal into which and out of which pass data signals, first means coupled between said CPU and RAM for bit serially transferring data ordered in bytes between said CPU and RAM data terminal and for transferring said memory address signal as a byte to said RAM memory address terminal and a clock pulse generating means producing time spaced pulses synchronized with the transfer of data, the improvement in said first means for the control of message signal transfer between said CPU and RAM, where the message signal comprises a single RAM address byte followed in succession by a plurality of data bytes, comprising in combination:

second means coupled to receive clock pulses from said clock pulse generating means and in response thereto producing a pulse marking the termination of each of said bytes (data or address) transferred in said first means;

third means having a terminal for receiving said RAM address byte thereat to be stored therein and coupled to said RAM address terminal to pass address signals thereto; and

fourth means responsive to a first of said pulses from said second means and coupled to said first means for transferring said address byte of said message to said third means terminal;

said third means being coupled to said second means for receiving said pulses therefrom and, response to each pulse, incrementing the value of RAM address byte stored therein in correspondance with the transfer of succeeding data bytes whereby said RAM is addressed to said address byte of said message and responsive to subsequent ones of said pulses for passing said data bytes serially between said CPU and RAM.

4,692,860
APPARATUS FOR LOAD REGULATION IN COMPUTER SYSTEMS

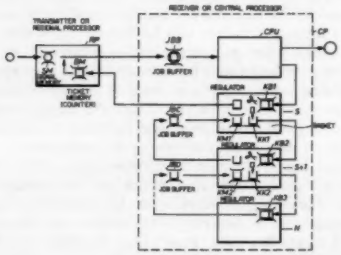
Ib N. Andersen, Trångsund, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 12, 1984, Ser. No. 588,796
Claims priority, application Sweden, Mar. 18, 1983, 8301507
Int. Cl.[4] G06F *15/00, 9/00*; H04J *3/24*
U.S. Cl. 364—200 **4 Claims**

1. A computer-controlled telecommunication system comprising a regional processor adapted to transmit message signals in response to an acknowledgement signal, and a central processor which receives the message signals for processing on at least three priority program levels, said central processor including means for insuring that all priority program levels

get a share of the central processor's capacity, said means comprising:

first, second and third job buffer means for storing message signals related to said priority program levels, said first job buffer means receiving message signals from the regional processor; a first priority level regulator comprising a first first-level memory means for storing ticket signals from said first job buffer means, second first-level memory means for storing basket signals received from said second job buffer means, third first-level memory means for storing the ticket signals from said first first-level memory means as coupon signals, first first-level control means responsive to the presence of the ticket and basket signals in said first and second first-level memory means respectively for transmitting a ticket signal to said third first-level memory means and a ticket signal as an acknowledgement signal to the regional processor and second first-level control means responsive to a predetermined number of coupon signals being stored in said third first-level memory means for clearing the latter, deleting a basket signal stored in said second first-level memory means, and for transmitting first carry signals; a second priority level regulator comprising a first second-level memory means for storing said first carry signals as ticket signals; second second-level memory means for storing basket signals received from said third job buffer means, third second-level memory means for storing the ticket



signals received from said first second-level memory means as coupon signals, first second-level control means responsive to the presence of the ticket and basket signals in said first and second second-level memory means respectively for transmitting a ticket signal to said third second-level memory means and a ticket signal to said second job buffer means, and second second-level control means responsive to a given number of coupon signals being stored in said third second-level memory means for clearing the latter, deleting a basket signal stored in said second second-level memory means, and for transmitting second carry signals; a third priority level regulator comprising a first third-level memory means for storing second carry signals as ticket signals, and first third level-control means for transmitting a ticket signal to said third job buffer means when a ticket signal is present in said first third-level memory means; first control means associated with said first priority level regulator responsive to the absence of message signals being stored in said first job buffer for transferring a basket signal, if present, from said second job buffer means to said second first-level memory means; and second control means associated with said second regulator means responsive to the simultaneous absence of message signals in said first and second job buffer means for transferring a ticket signal, if present, from said third job buffer means to said second second-level memory means whereby said message signals are processed at said three priority program levels.

4,692,861

MICROCOMPUTER WITH INTERPROCESS COMMUNICATION

Michael D. May, Bristol, United Kingdom, assignor to Inmos Limited, Bristol, England

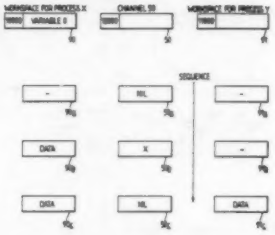
PCT No. PCT/GB84/00124, § 371 Date Dec. 4, 1984, § 102(e) Date Dec. 4, 1984, PCT Pub. No. WO84/04188, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 11, 1984, Ser. No. 679,041

Claims priority, application United Kingdom, Apr. 11, 1983, 8309770

Int. Cl.[4] G06F *9/06*

U.S. Cl. 364—200 **36 Claims**



1. A microcomputer comprising memory and a processor coupled to read from and write into said memory, said processor for executing a plurality of concurrent processes having sequential instructions in respective programs, said instructions including a communication instruction of a first type to output data and a communication instruction of a second type to input data, said microcomputer comprising:

(i) process scheduling means having:

a. means for identifying one or more processes which form a collection awaiting execution by the processor,

b. means, cooperating with said means for identifying, for descheduling a process by interrupting execution of the current process,

c. means, cooperating with said means for identifying, for scheduling a process by adding it to said collection, and

(ii). a synchronizing channel for enabling a synchronized communication between a pair of said processes each having a single communication instruction in its program to enable said synchronized communication between the pair of processes, said channel comprising means for holding either a first value indicating that one of said pair of processes has reached a communication instruction in its program requiring communication through said channel, or a different value indicating that neither process of said pair has reached a communication instruction in its program requiring communication through said channel, and

(iii). control means responsive to execution of a communication instruction by one of said pair of processes to test the contents of said channel, said control means being responsive to location of said first value in said channel to continue executing instructions of the current process and responsive to location of a different value in said channel to deschedule the current process,

whereby both processes in said pair are at corresponding program instructions when said communication occurs, and neither process of said pair is descheduled more than once to effect said synchronized communication.

4,692,862

RAPID MESSAGE TRANSMISSION SYSTEM BETWEEN COMPUTERS AND METHOD

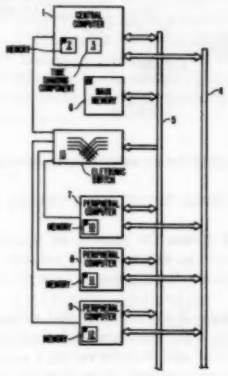
Daniel Cousin, Asnieres; Jean-Francois Garnier, Rueil-Malmaison, and Jean-Pierre Georges, Sevres, all of France, assignors to Jeumont-Schneider Corporation, France

Continuation-in-part of Ser. No. 726,944, Apr. 26, 1985, abandoned, which is a continuation of Ser. No. 324,387, Nov. 10, 1981, abandoned. This application Dec. 11, 1985, Ser. No. 807,697

Claims priority, application France, Mar. 6, 1981, 8005287

Int. Cl.[4] G06F *13/38*

U.S. Cl. 364—200 **5 Claims**



1. A computer network including a central computer, a plurality of peripheral computers, a common memory accessible by said central computer and said peripheral computers over a single bus connected to said common memory, time-sharing means connected to said central computer and said peripheral computers for regulating access to said common memory by said central computer and said peripheral computers, and electronic switch means having switchable connections to the respective central and peripheral computers and having control means connected to said bus for receiving control signals from said central computer, whereby direct connections between respective members of one or more selected pairs of computers may be effected through said electronic switch means so that the respective members of each of said pairs of computers may communicate directly through said switch means.

4,692,863

ELECTRONIC APPARATUS FOR GENERATING SETS OF NUMERICAL VALUES FOR PLAYING LOTTERY GAMES

Alexander P. Moosz, 240 Cadillac, Beaconsfield, Quebec, Canada

Filed Mar. 18, 1985, Ser. No. 712,725

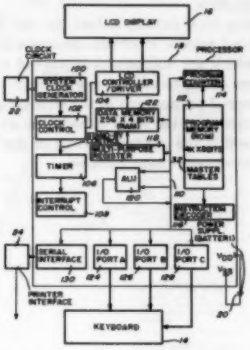
Int. Cl.[4] G06F *15/28, 15/44*

U.S. Cl. 364—412 **22 Claims**

1. An electronic apparatus for generating combinations of numbers to be used by a player when selecting his bets for a lottery game of the 6/36, 6/44 or 6/49 type more generally expressed as m/k wherein m is the number of distinct numbers forming a combination C_j and wherein said distinct numbers being chosen from an array A_k constituted by a number k of consecutive numbers usually ranging from 1 to k, said apparatus generating a plurality of different combinations C_j taking into consideration parameters dictated by the player, said apparatus comprising:

input means for entering said parameters, namely for entering n distinct selected numbers chosen from said array A_k thus forming a sub-array a_i wherein n is greater than m and less than k, and for entering p, a redundancy index whose numerical value is less than m;

processor means operatively connected to said input means for storing said n distinct selected numbers and said redundancy index p, said processor means successively generating a comprehensive series of combinations C_j of said



distinct selected numbers n chosen from said sub-array a_i, the combinations C_j from said comprehensive series satisfying a predetermined relationship with the selected redundancy index p; and

output means operatively connected to said processor means for successively outputting the combinations C_j generated by said processor means.

4,692,864

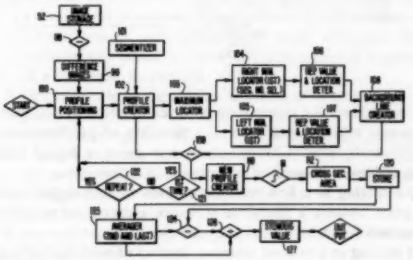
METHOD OF DETERMINING STENOSIS OF BLOOD VESSELS

Yair Shimoni, Jerusalem; Paul Fenster, Petach Tikva, and Bilha Nissenson, Herzlia, all of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed May 23, 1985, Ser. No. 737,144

Int. Cl.[4] G01N *23/00*; A61B *5/02*

U.S. Cl. 364—414 **29 Claims**



1. A method for using digital subtraction angiography (DSA) equipment to obtain quantitative measurements of stenosis, said method comprising the steps of:

obtaining a DSA pixelized image of a blood vessel including a stenotic portion and a normal portion of the blood vessel;

determining a number proportional to the cross sectional area of the blood flowing through the blood vessel at said stenotic portion of the blood vessel;

determining a number proportional to the cross sectional area of the blood flowing through the blood vessel at said normal portion of the blood vessel;

said steps of determining a number proportional to the cross section area of the blood flowing comprising the steps of:

creating density profiles across the blood vessel at said stenotic portion and at said normal portion;

detecting the edges of the blood vessel on the density profiles;

evaluating residual density background values along the density profiles;

compensating total density values for said residual density background values to obtain compensated total density values which are numbers proportional to the cross sectional area of the blood flowing through the blood vessel at the normal portion and at the stenotic portion; and

using the compensated total density values at the normal portion and at the stenotic portion of the blood vessel to quantitatively determine stenosis.

4,692,865

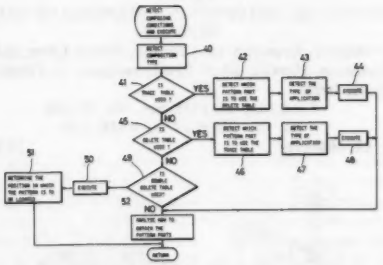
METHOD AND A SYSTEM FOR COMPOSING THE PATTERN OF THE CHINESE CHARACTER

Chi-Ching Hsu, Taipei, Taiwan, assignor to Multitech Industrial Corporation, Taipei, Taiwan

Filed Mar. 13, 1985, Ser. No. 711,101

Int. Cl.[4] G06F *15/38*; G06G *7/60*; G09G *1/06*; B41J *5/00*

U.S. Cl. 364—419 **16 Claims**



1. A method for composing a series of requested Chinese characters which are a part of a plurality of predetermined less-frequently-used Chinese characters using a digital computer system, said method comprising the steps of:

(a) a storing in a first memory section of said digital computer system a plurality of entire patterns of predetermined frequently-used Chinese characters;

(b) storing in a second memory section of said digital computer system command data for composing said predetermined less-frequently-used Chinese characters;

(c) retrieving a datum of said command data from said second memory section for one of said requested Chinese characters;

(d) processing said retrieved command datum to obtain two selected entire patterns from said first memory section, to obtain two pattern parts, a first pattern part and a second pattern part, from said two selected entire patterns, and to compose said requested Chinese character by using said two pattern parts; and

(e) repeating said steps (c) and (d) until said series of requested Chinese characters is entirely composed.

4,692,866

AUTOMATIC SHIFT CONTROL SYSTEM

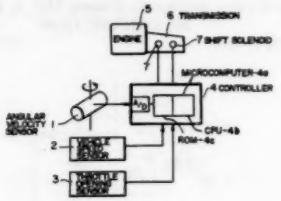
Shuichi Kosuge, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 13, 1985, Ser. No. 701,222

Claims priority, application Japan, Feb. 14, 1984, 59-26845

Int. Cl.[4] F16H *5/66*; B60K *41/06*; G06F *15/50*

U.S. Cl. 364—424.1 **5 Claims**



4. A control system for an automatic transmission of a vehicle comprising:

speed sensing means for sensing a running speed of said vehicle;

throttle sensing means for sensing an opening angle of a throttle valve of an engine of said vehicle;

curve sensing means for sensing an angular velocity of said vehicle;

means for storing a shift pattern of said automatic transmission in relation to the running speed of said vehicle and the opening angle of said throttle valve;

controlling means, coupled to said speed sensing means, throttle sensing means, curve sensing means and storing means, for: (1) correcting said sensed opening angle of said throttle valve in accordance with the sensed angular velocity of said vehicle so that a corrected opening angle of said throttle valve increases with the increase in the angular velocity of said vehicle and (2) commanding shifts of said automatic transmission in response to the sensed running speed of said vehicle and the corrected opening angle of said throttle valve based on said stored shift pattern.

4,692,867

BRAKE CONTROL SYSTEM

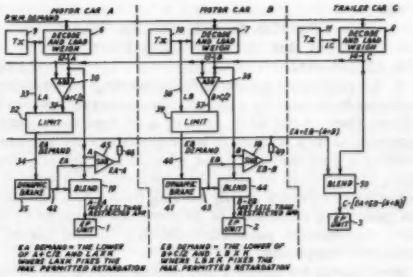
John D. Poole, Devizes, England, assignor to Westinghouse Brake and Signal Co., Ltd., Wiltshire, England

Filed Jan. 31, 1985, Ser. No. 696,583

Claims priority, application United Kingdom, Feb. 13, 1984, 8403721

Int. Cl.[4] B60T *8/04*

U.S. Cl. 364—426 **11 Claims**



1. A brake control system for a multiple unit train, of motor

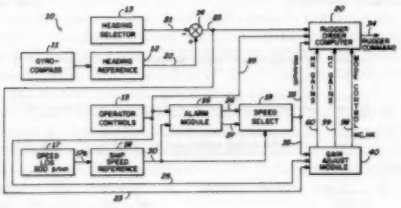
and trailer units, which has a mixed braking system of dynamic and friction brakes in which the dynamic brakes are applied preferentially, said system comprising means for generating a brake demand signal calling for a rate of retardation of the train, load responsive means on each unit operative to provide for a unit, a load weighed brake signal corresponding to the brake demand signal and in accordance with the load of the unit, summing means having inputs connected to receive the load weighed brake signals from all units and an output connected to control actuation of the dynamic brake system, friction brake controlling means on each unit connected to control the level of friction braking of a respective unit in response to the difference between the load weighed brake signal for the unit and a further signal which, on a dynamically braked unit, represents the dynamic braking effort achieved or, on a trailer unit, the excess of dynamic brake effort achieved over that required by the load weighed signals of the dynamically braked units and dynamic brake control signal limiting means operative to effectively limit dynamic braking to a calculated maximum adhesion limit.

4,692,868

ADAPTIVE AUTOPILOT

Charles R. Wesner, Crozet; John F. Yancey, Charlottesville, and Albert L. Coleman, Scottsville, all of Va., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 18, 1985, Ser. No. 692,465
Int. Cl.[4] G06F *15/50*; G05D *1/08*
U.S. Cl. 364—447 **14 Claims**



1. A method of heading keeping to minimize propulsion losses in a marine vessel utilizing an adaptive autopilot that has been calibrated to establish allowable minimum and maximum rudder order signal gains, comprising the steps of:

establishing a plurality of intermediate rudder order signal gain steps lying between said minimum and maximum rudder order signal gains,

measuring a reference heading error signal over a selected time period,

comparing said reference heading error signal with a current heading error signal,

increasing or decreasing said rudder order signal gain in said intermediate steps to one of said steps in response to said comparison of said reference and current heading error signals for providing an optimum rudder order signal gain that minimizes propulsion losses,

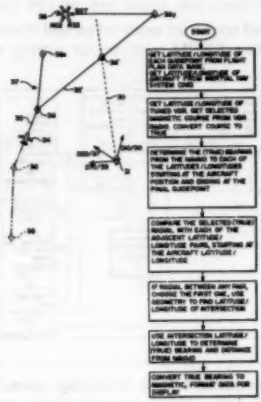
maintaining said optimum rudder order signal gain until changing conditions cause said comparison of reference and current heading error signals to exceed a predetermined limit thereby initiating selection of a new optimum rudder order signal gain for controlling the rudder of said marine vessel so as to provide said heading keeping.

4,692,869

AIRCRAFT NAVIGATIONAL SYSTEMS AND METHODS FOR CREATING NAVIGATIONAL GUIDEPOINTS

Ethmer W. King; Robert C. Kircher, Jr., and David S. Yotsuuye, all of King County, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 28, 1985, Ser. No. 716,979
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—448 **48 Claims**



1. An aircraft navigational system comprising:

a. receiver means for

1. receiving electronic navigational signals from a selected navigational station, and

2. for outputting a navigational signal defining a first selected navigational radial of the selected navigational station;

b. computer means, including a memory, responsive to said first navigational signal and arranged to:

1. provide a first informational signal indicating geographical locations of a plurality of selected guidepoints which define a navigational route;

2. respond to said first navigational signal and to provide a second informational signal indicating a first point of intersection of said navigational route with said first navigational radial to define the geographical location of a first new guidepoint;

3. determine the geographical location of said first guidepoint by

(i) determining the position of said selected navigational radial between two of said selected guidepoints, and

(ii) measuring a distance along said navigational route between said navigational radial and at least one of said two selected guidepoints; and

4. storing data defining the geographical location of said first guidepoint in said memory.

4,692,870

GENERAL PURPOSE PROCESSOR MODULE FOR MAILROOM EQUIPMENT

Flavio Manduley, Woodbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 20, 1984, Ser. No. 684,411
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—466 **15 Claims**

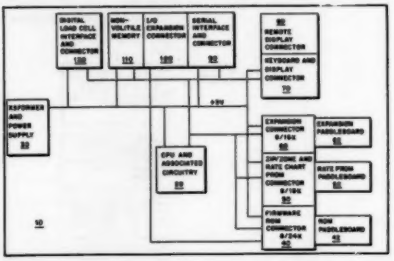
1. An electronics module suitable for use in a plurality of different postage scales which may have various weight ranges and capabilities as well as in other types of mailroom equipment such as electronic accounting systems, comprising:

(a) means for mounting electronic components and connectors;

(b) processing means mounted on said mounting means for processing weight information or postal information relating to an item to be mailed;

(c) a first connector mounted on said mounting means for connecting read-only-memory (ROM) modules for storing selected firmware to said processing means so that appropriate firmware to program said processing means in accordance with a preselected set of capabilities is provided;

(d) a second connector mounted on said mounting means for connecting PROM modules for storing selected postal



rate information to said processing means so that appropriate information for the determination of postage values is provided;

(e) an input/output connector mounted on said mounting means for connecting keyboard means and display means to said processor means so as to provide an operator interface for entry of postal information and commands;

(f) a serial data interface for the transmission of information relating to items to be mailed by said processing means; and,

(g) a non-volatile memory module connected to said processing means through one of said first or second connectors, said non-volatile memory module containing information defining said keyboard means.

4,692,871

INPUT DEVICE FOR SEWING MACHINE

Tomoaki Kinoshita; Kunio Takano; Masanori Nukushina; Minoru Wada, and Hiroshi Tokunaga, all of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Jul. 30, 1985, Ser. No. 760,650

Claims priority, application Japan, Jul. 31, 1984, 59-160778

Int. Cl.[4] G06F *15/46;* D05B *3/02*

U.S. Cl. 364—470 **3 Claims**

1. A sewing machine input device for inputting stitch patterns of a workpiece, comprising:

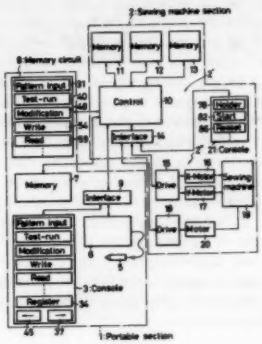
a first portion including a digitizer for inputting stitching patterns, a first memory circuit logically coupled through control means to said digitizer for storing said stitching patterns, a second memory circuit logically coupled to said control means for storing various control programs, and command generating means logically coupled through said control means to said second memory circuit for selecting among said control programs; and

a second portion including said control means, said control means being adapted to execute said selected control programs;

said first portion being coupled to said second portion through said control means during the inputting operation;

said second portion being provided in a sewing machine; and

wherein said control means is adapted to control inputting of a stitch pattern, test-running the stitch pattern, modifying



the stitch pattern, writing the stitch pattern and reading the stitch pattern.

4,692,872

NUMERICAL CONTROL SYSTEM WITH PLURAL GROUPS OF MISCELLANEOUS FUNCTIONS

Nobuyuki Kiya, Hachioji, Japan, assignor to Fanuc LTD, Minamitsuru, Japan

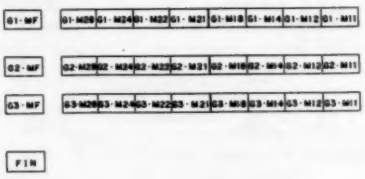
PCT No. PCT/JP85/00380, § 371 Date Feb. 13, 1986, § 102(e) Date Feb. 13, 1986, PCT Pub. No. WO86/00726, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 5, 1985, Ser. No. 834,245

Claims priority, application Japan, Jul. 6, 1984, 59-138930

Int. Cl.[4] G06F *3/04;* G05B *19/18*

U.S. Cl. 364—474 **5 Claims**



1. A numerical control system for controlling a machine based on a machining program, comprising:

a numerical control section for outputting numerical control signals based on the machining program, comprising:

memory means for storing miscellaneous function instructions divided into plural groups; and

interface means for outputting a specific miscellaneous function instruction from among the divided miscellaneous function instructions as well as a code read command signal including a group number to which the specific miscellaneous function instruction belongs; and

a programmable controller section, operatively connected to the numerical control section and the machine, for executing sequential control of the machine based on the numerical control signals from said numerical control section, comprising:

decoding means for decoding the specific miscellaneous function instruction on the basis of the code read command signal sent by the numerical control section; and

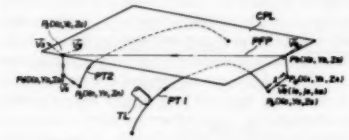
miscellaneous function executing means for executing the sequential control of the machine in accordance with a plurality of decoded miscellaneous function instructions.

4,692,873

MACHINE TOOL PICK FEED METHOD

Hajimu Kishi, and Kunio Tanaka, both of Tokyo, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Filed Jun. 25, 1985, Ser. No. 752,075
Claims priority, application Japan, Oct. 31, 1983, 58-204575
Int. Cl.[4] B23Q 15/013
U.S. Cl. 364—474 5 Claims



1. A method of machining using a machine tool having a tool and axes of rotation for subjecting a workpiece to desired machining, said method comprising the steps of:

moving the tool, having a central axis, relative to a workpiece in one direction along a first cutting parh from a first maching start point;

positioning the tool at a machining starting point on a second cutting path after the completion of machining along said first cutting path at a cutting path end point Pe;

moving the tool relative to the workpiece along said second cutting path in said one direction to perform machining;

specifying a tool retraction quantity for retracting the tool from the cutting path end point Pe;

specifying a plane containing a path along which the tool is moved toward the second cutting starting point Ps, on said second cutting path;

obtaining coordinate values of a point Pa distanced from the cutting path end point Pe by said tool retraction quantity in the direction of the central axis of the tool at the cutting path end point Pe;

obtaining coordinate values of a point Pb in said plane on a perpendicular dropped from said plane to the point Pa;

obtaining coordinate values of a point Pd distanced from the second cuttting path starting point Ps by said tool retraction qunatity in the direction of the central axis of the tool at the second cutting path starting point Ps;

obtaining coordinate values of a point Pc in said plane on a perpendicular dropped from said plane to the point Pd;

creating NC data, in accordance with the obtained coordinates, for positioning the tool at the second cutting startin point Ps along a pick feed path Pe→Pa→Pb→Pc→Pd→Ps;

positioning the tool at the second cutting starting point by moving the tool along said pick feed path in accordance with said NC data; and

performing machining by moving the tool along said second cutting path in said one direction.

4,692,874

ELECTRONIC WATT-HOUR METER

Yuji Mihara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

PCT No. PCT/JP84/00523, § 371 Date Jun. 25, 1985, § 102(e) Date Jun. 25, 1985, PCT Pub. No. WO 85/01901, PCT Pub. Date May 9, 1985
PCT filed Oct. 30, 1984, Ser. No. 668,866
Claims priority, application Japan, Nov. 11, 1983, 58-212049
Int. Cl.[4] G01R 21/00; G06F 15/56
U.S. Cl. 364—483 1 Claim

1. An electronic watt-hour meter comprising:

an electric power measuring device;

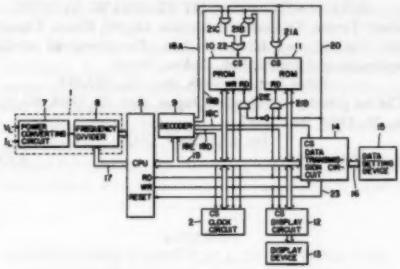
a data setting device for setting data including time zone data and holiday data, and for setting programs for displaying measurement results with respect to different time zones in the form of effective, reactive, or apparent electric power as desired by using said data setting device;

a data transmission circuit to which the data setting device is connected detachably;

a programmable read only memory circuit (PROM) which receives the data and programs set by the data setting device through the data transmission circuit and stores the set data and programs;

a read only memory (ROM) which preliminarily stores transmission programs for controlling said data transmission circuit;

a central processing unit (CPU) which controls the power measuring device so as to receive measurement results therefrom in accordance with the set data and programs stored in said PROM, and which also controls receiving



and storing data and programs in said PROM in accordance with said transmission programs in said ROM;

a display device which displays the measured results under the control of said CPU; and

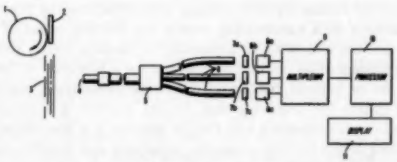
a switch means for making said CPU operate in accordance with the data and programs in said PROM when said data setting device is detached from said data transmission circuit, and for making said CPU operate in accordance with the transmission programs in said ROM when said data setting device is attached to said data transmission circuit.

4,692,875

METAL ALLOY IDENTIFIER

William D. Riley, and Robert D. Brown, Jr., both of Avondale, Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 22, 1984, Ser. No. 623,753
Int. Cl.[4] G01J 3/06, 3/30; G06F 15/46
U.S. Cl. 364—497 18 Claims



1. An apparatus for identifying a metal alloy comprising:

a grinding wheel adapted to be applied against a surface of a sample of the metal alloy and rotated to generate solely by said application glowing hot sparks from the surface;

an optical probe exposed to said glowing hot sparks and adapted to generate a multiwavelength visual signal therefrom;

signal dividing means for dividing the multiwavelength visual signal into separate parts;

filter means for filtering the separate parts of said divided multiwavelength visual signal;

detector means for measuring respective intensities of the single wavelength filtered signals; and

data processing means coupled to the detector means for

generating ratios of the measured intensities with respect to at least one other of the measured intensities.

4,692,876

AUTOMATIC FREIGHT STACKING SYSTEM

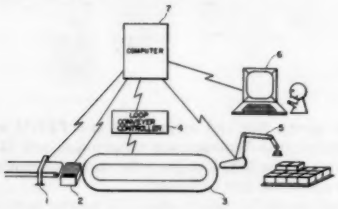
Tadashi Tenma, Sagamihara; Kichizo Akashi, Ebina; Yozo Konishi, Tochigi, and Hideo Watase, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

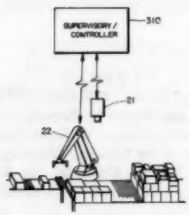
Filed Oct. 15, 1985, Ser. No. 787,455

Claims priority, application Japan, Oct. 12, 1984, 59-212517; Dec. 26, 1984, 59-272917

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—513 6 Claims





1. An automatic freight stacking system comprising: loading scheduler means for determining respective loading positions of articles on a transporting means, the loading order of said articles, the allocation of a plurality of loading means and the preparation of an operation sequence for a plurality of freight articles of various configurations to be transported; marshalling means for receiving said freight articles in a given sequence and delivering said freight articles in a predetermined loading order; feeding means for supplying said freight articles from said marshalling means to the places of respective one of said plurality of loading means allocated to said freight articles, in dependence on the configurations thereof, by said loading scheduler means; conveyor means for moving said transporting means to the places of respective ones of said plurality of loading means allocated by said loading scheduler means; each of said plurality of loading means loading said freight articles allocated thereto in dependence on the configurations thereof on said transporting means in accordance with said operation sequence; and general control means receiving data from said loading scheduler means for controlling said marshalling, feeding, conveyor and plurality of loading means in a coordinated manner.

4,692,877

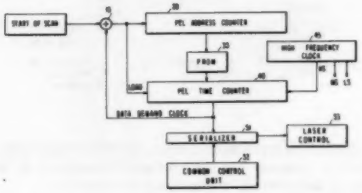
DIGITAL TIMING CONTROL SYSTEM WITH MEMORY LOOK AHEAD

Kent A. Byerly, Tucson, Ariz.; Marvin E. Feldhacker, Longmont, and Duane E. Grant, Boulder, both of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,247

Int. Cl.[4] H04N *1/27*

U.S. Cl. 364—514 10 Claims



1. A pel clock generator especially suited for a resonant galvanometer scanner with non-linear displacement profile comprising:

memory means with a plurality of memory positions for storing a parameter for a plurality of pels in a scan;

preset counter means loaded from said memory means and responsive to a regular clock signal for generating a pel clock each time said preset counter means counts to a specified condition,

address counter means with an output for addressing said memory means, and

means for changing state of said address counter means in response to an output of said preset counter means.

4,692,878

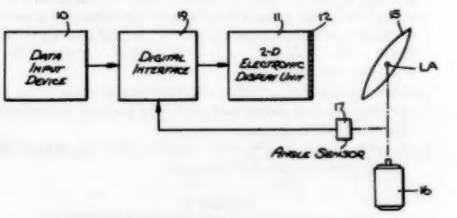
THREE-DIMENSIONAL SPATIAL IMAGE SYSTEM

Bernard M. Ciongoli, Totowa, N.J., assignor to Ampower Technologies, Inc., Totowa, N.J.

Filed Mar. 29, 1985, Ser. No. 717,796

Int. Cl.[4] G06F *15/40*; G09G *3/20*; G06K *9/42*

U.S. Cl. 364—518 10 Claims



1. A three-dimensional spatial image system comprising:

A. a data input device having stored therein a three-dimensional image of an object in the form of a family of points, each point of which is defined by digital data representing x-y-z Cartesian coordinates of that point,

B. an electronic display on whose face is presented a two-dimensional image of the object defined by activated luminous pixels whose positions correspond to the x-y Cartesian coordinates in said family of points;

C. a lens rotating at a constant rate on an axle normal to its optical axis and parallel to the display face whereby the angle of the lens relative to the face undergoes continuous change in the course of each revolution thereof, the lens projecting each of the luminous pixels into a model space in front of a viewer to produce a corresponding luminous dot at a location therein that depends on the lens angle;

D. a sensor associated with the rotating lens to produce a

reference pulse each time the lens is at a predetermined angle whereby a reference pulse is produced during each revolution of the lens; and

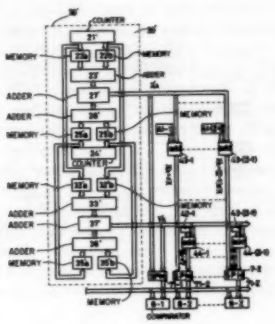
E. a digital interface connecting the data input device to said electronic display, said interface being constituted by a computer functioning in response to said reference pulse to compute the changing angles assumed by said lens in the course of each revolution to produce lens-angle digital signals and to process the x-y-z digital data signals received from the input device in relation to the lens angle digital signals to cause activation of the related pixel in the electronic display at the instant at which the lens angle is such as to project the corresponding luminous dot into the model space at a location in accordance with the z-coordinate whereby rotation of the lens results in a family of luminous dots in the model space at respective x-y-z locations therein to create a three-dimensional spatial image of the stored object.

4,692,879

METHOD OF AND APPARATUS FOR FORMING THE ADDRESS SIGNALS OF A SCREEN MEMORY OF A HALF TONE DOT GENERATOR

Kunio Ikuta, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Feb. 5, 1985, Ser. No. 698,522
Claims priority, application Japan, Feb. 9, 1984, 59-23705
Int. Cl.[4] H04N *1/46, 1/40*
U.S. Cl. 364—518 **13 Claims**



7. An apparatus for forming halftone dots onto a photosensitive film according to a recording signal obtained by comparing an image signal from an original with corresponding thresholds from a screen memory comprising:

(a) a means for generating the sub-scanning addresses x_n and the main scanning addresses y_n of recording points of a recording beam;

(b) table memories for respectively storing according to the equations:

$$X = y_n \cdot \Delta X + x_n \cdot \Delta' X, \text{ and}$$

$$Y_A = y_n \cdot \Delta Y + x_n \cdot \Delta' Y$$

(i) the values $y_n \cdot \Delta X$ according to the addresses y_n,
(ii) the values $x_n \cdot \Delta' X$ according to the addresses x_n,
(iii) the values $y_n \cdot \Delta X$ according to the addresses x_n, and
(iv) the values $x_n \cdot \Delta' Y$ according to the addresses y_n; wherein
X_A = the sub-scanning addresses of the screen memory,
Y_A = the main scanning addresses of the screen memory,
x_n = the sub-scanning recording addresses (pixel numbers),
y_n = the main scanning recording addresses (pixel numbers),

$$\Delta X = -P \sin \theta / \frac{S}{m},$$

$$\Delta Y = P \cos \theta / \frac{S}{m},$$

$$\Delta' X = P \cos \theta / \frac{S}{m}, \text{ and}$$

$$\Delta' Y = P \sin \theta / \frac{S}{m},$$

P = the length of each side of one pixel,
S = the length of each side of one unit of a screen memory, and

(c) two adders for respectively obtaining the sub-scanning addresses X_A and the main scanning addresses Y_A by respectively summing up the values (α) $y_n \cdot \Delta X$ and $x_n \cdot \Delta' X$, and the values (β) $y_n \cdot \Delta Y$ and $x_n \cdot \Delta' Y$;

(d) a screen memory for storing halftone sub-cell thresholds with the addresses X_A and Y_A; and

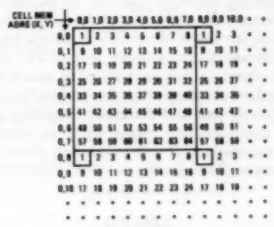
(e) means for applying the recording beam on said photosensitive film in accordance with said addresses X_A and Y_A.

4,692,880

MEMORY EFFICIENT CELL TEXTURING FOR ADVANCED VIDEO OBJECT GENERATOR

Donald M. Merz, Ormond Beach; Jimmy E. Chandler, Ponce Inlet, and Richard Economy, Ormond Beach, all of Fla., assignors to General Electric Company, Philadelphia, Pa.

Filed Nov. 15, 1985, Ser. No. 798,313
Int. Cl.[4] G09B *9/00;* **G09G** *1/00;* **G06F** *15/626*
U.S. Cl. 364—521 **8 Claims**



1. An improved advanced video object generator including data memory means for storing cell-by-cell object data for a plurality of objects for retrieval and processing for video display, vector processing means for calculating object transformations for translating operator inputs into image orientation control signals for calculating pixel-bypixel image data, cell texture address means for determining the memory location to be accessed for retrieval of cell texture data for display, cell texture output means for outputing said cell texture data, span processing means for translating said cell texture data into pixel-by pixel display data, and video monitor means for displaying images of objects comprising pixel-by-pixel displays of said display data, the improvement comprising:

at least one memory hardware map coupled to said data memory means, said at least one memory map having a plurality of n×n memory locations for storing n^2 cell sets of cell texture data;

means for reading out two independent n^2 cell sets simultaneously coupled to said cell texture output means, each of the two independent n^2 cell sets indicative of corresponding object data at respectively different levels of detail;

means for blending the data in said two independent n^2 cell sets, the means for blending coupled to the means for reading out two independent n^2 cell sets;

wherein each of said two independent n^2 cell sets are allo-

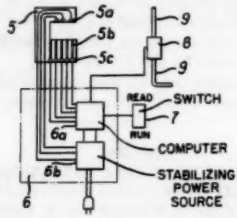
cated to a respective subspan at the respective levels of detail for simultaneously obtaining data for a plurality of pixel calculation paths, said cell texture address means including means for addressing the memory locations of an n×n cell set by a single subspan address or the single subspan address plus one.

4,692,881

DEVICE FOR DISCRIMINATING ATTITUDE OF PARTS

Tsutomu Miyata, and Masahide Nagai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation of Ser. No. 505,777, Jun. 20, 1983, abandoned. This application Oct. 7, 1986, Ser. No. 917,244
Claims priority, application Japan, Dec. 18, 1981, 56-204795
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—551 **14 Claims**



1. A device for discriminating the attitude of parts comprising: a detector composed of a plurality of light receiving elements disposed in a singular line or in plural lines extending in a direction perpendicular to a feeding direction of the parts, and at least one light emitting element spaced from and facing said light receiving elements; a RAM for memorizing a reference signal pattern for use as a standard obtained by successively detecting the shape of a part as it travels past said detector in a preselected desired attitude; and a CPU for comparing the reference signal pattern memorized in said RAM with the signal data pattern obtained when the parts to be discriminated travel successively past said detector in arbitrary attitudes and producing a discrimination output signal in response to each unfavorable comparison thereby denoting those parts which are not in the preselected attitude.

4,692,882

APPARATUS FOR RECORDING THE SPEED OF A VEHICLE

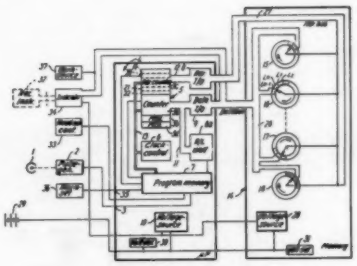
Helge Skovgaard, No. 4 Holmegårdsparken, 2980 Kokkedal, and Kent Johansen, Paul Bergsoe Kollegiet, No. 190 Skodsborgvej, 2850 N rum, both of Denmark

PCT No. PCT/DK83/00050, § 371 Date Dec. 19, 1984, § 102(e) Date Dec. 19, 1984, PCT Pub. No. WO84/04415, PCT Pub. Date Nov. 8, 1984
PCT Filed Apr. 27, 1984, Ser. No. 689,549
Int. Cl.[4] G07C *5/08*
U.S. Cl. 364—565 **6 Claims**

1. A digital vehicle speed recorder for recording successive speed values of a motor vehicle over a predetermined road distance, comprising:

a pulse generator connected to a velocity sensor in the vehicle for generating control pulses with a pulse separation corresponding to a given road length, a clock generator for generating internal clock pulses, a microcomputer for calculating said speed values on the basis of said control pulses and said clock pulses, a speed value memory for storing successive speed values with a recording rate dependent on the road distance covered, and read-out means associated with said memory for connection with a reproducing instrument for obtaining a visual presentation of the speed values stored in the memory, said microcomputer having a first interrupt input connected to said pulse generator, said microcomputer including in its working memory a counter connected to said clock generator to be incremented by said clock pulses, a memory location for storing a predetermined maximum of the counter value, and comparator means connected to said counter and said memory location for continuously comparing the actual counter value in said counter with said maximum counter value and generating an internal interrupt signal when said counter value exceeds said maximum counter value, said counter and said memory location both being connected to said speed value memory to transfer, in response to each pulse supplied from said pulse generator to said first interrupt input or in response to said internal interrupt signal, whichever occurs first, said actual counter value or said maximum counter value, respectively, or a speed value derived therefrom to said speed value memory,

said speed value memory comprising a plurality of memory blocks coupled in series and each having a number of memory locations connected in a circular arrangement, said locations being individually addressed from addressing means in the working memory of said microcomputer in a cyclically repeated order of succession, said memory locations in each block except the last block being grouped in a number of memory sections such that:



a first memory block is addressed from said addressing means in response to each interrupt signal at said first interrupt input or said internal interrupt, whichever occurs first, for successively recording said counter values or said maximum, respectively, or speed values derived therefrom in the memory locations of the first memory block,

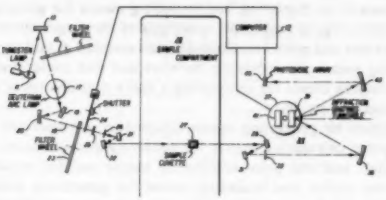
all memory blocks except the last one are controlled by said addressing means to address all memory locations of the memory section containing the latest addressed memory location for transferring the speed values in said memory locations to an arithmetic-logic unit of said microcomputer in response to addressing of a predetermined one of said memory locations for calculating a single function value on the basis of all the speed values stored in said memory locations, and

the memory locations of each memory block after the first block are successively addressed by said addressing means for recording function values calculated from the speed values stored in memory sections in the preceding memory block.

4,692,883
AUTOMATIC DIGITAL WAVELENGTH CALIBRATION SYSTEM FOR A SPECTROPHOTOMETER

Michael R. Nelson, Downers Grove; Roy E. Boostrom, Elmhurst, both of Ill.; Jerry E. Cahill, Trumbull, Conn., and Tzong Hwang, Villa Park, Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 21, 1985, Ser. No. 704,356
Int. Cl.[4] G01C *25/00;* **G06F** *15/46*
U.S. Cl. 364—571 **8 Claims**



1. A digital wavelength calibration system for a spectrophotometer comprising, in combination:

a photodiode array forming an output detector for said spectrophotometer and having an ordered number of spaced pixels, each pixel being identifiable by an ordinal number;

a light source for generating at least one reference emission line of known peak wavelength;

means for causing the peak of said reference line to fall in close proximity to the center of a preselected pixel of said photodiode array;

peak location means for computing the exact position data of said peak relative to said pixel center in terms of pixel spacing and the ordinal number of said preselected pixel and for retaining said position data for subsequent wavelength computation;

wavelength identification means for computing the numerical relationship data of the ordinate number of each pixel to the wavelength falling on that pixel and for retaining said relationship data for subsequent correlation with data generated by said pixel, and

means for computational processing and display of said pixel generated data correlated with the associated wavelength value.

4,692,884
REMOTE OPERATION OF OPTICAL SYSTEM

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto, Ltd., Canada

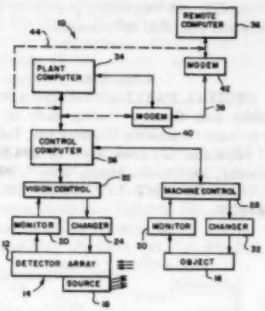
Filed Jan. 3, 1983, Ser. No. 454,989
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—573 **19 Claims**

1. A control system for a detector array based optical system for machine vision having a detector array which receives light reflected sequentially from a plurality of succeedingly presented objects, comprising:

a transmitting means for remotely locating the control system from the optical system;

a detecting means for detecting a light characteristic of the reflected light received by the detector array during use on a presented object and for transmitting an electrical signal indicative of said light characteristic via said transmitting means to the control system; and

an adjusting means for adjusting a light characteristic variable of said optical system for the succeeding objects when the received light characteristics of the detector array for at least one of the previous objects is deficient, wherein said adjusting means adjusts a light characteristic

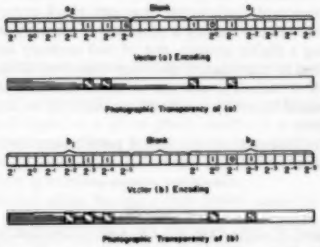


variable which is one of detector array scan rate, integration time, and light output level.

4,692,885
OPTICAL FLOATING-POINT MATRIX-VECTOR MULTIPLIER

Richard P. Bocker, San Diego, and William J. Miceli, La Jolla, both of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1985, Ser. No. 813,738
Int. Cl.[4] G06J *1/00;* **G06G** *9/00*
U.S. Cl. 364—606 **15 Claims**



1. An apparatus for performing optical matrix-vector multiplication using floating-point arithmetic comprising:

a source of collimated light;

first means disposed to be illuminated by the collimated light for providing an encoded representation of a first vector element in a serial bit stream, the first vector encoded representation providing means is adapted to have the bit stream incrementally displaced in a first direction past the collimated light source;

second means disposed to be illuminated by the portion of collimated light passing through the first vector encoded representation providing means for providing an encoded representation of a matrix in parallel bit streams, the matrix encoded representation providing means is adapted to have the bit stream incrementally displaced in a second direction that is opposite said first direction as it passes the collimated light source and the interposed first vector encoded representation providing means, the encoded representations of the first vector and matrix are normalized floating-point representation, and the passing of colli-

mated light that traverses the encoded representations of the first vector encoded representations of the matrix encoded representation providing means effects a multiplication and a convolving thereof; and

means disposed in an aligned relationship with the first vector encoded representation providing means and the matrix encoded representation providing means for adding multiplied encoded information.

4,692,886

DIGITAL PATTERN GENERATOR

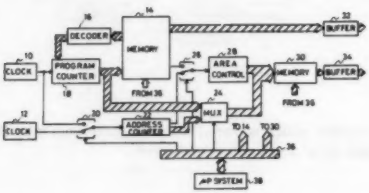
Yasuhiko Miki, and Kentaro Takita, both of Tokyo, Japan, assignors to Sony/Tektronix Corporation, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,599

Claims priority, application Japan, May 7, 1984, 59-90445

Int. Cl.[4] G06F *1/02*; G10H *1/00*

U.S. Cl. 364—718 **9 Claims**



1. A digital pattern generator comprising:

a first memory for storing an execution control signal, an area control signal and a digital pattern;

a clock generator for generating a clock signal;

a program counter for generating a first address signal in accordance with said clock signal from said clock generator and said execution control signal from said first memory, said first address signal addressing said first memory;

an address counter for generating a second address signal by counting said clock signal from said clock generator; and

a second memory having a plurality of memory areas each storing a digital pattern, one of said memory areas being selected in accordance with said area control signal from said first memory, and the selected memory area being addressed by said second address signal from said address counter;

whereby first and second digital patterns are derived from said first and second memories respectively.

4,692,887

CIRCLE AND CIRCULAR ARC GENERATOR

Katsuro Hashidate, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,057

Claims priority, application Japan, May 10, 1983, 58-81467; May 10, 1983, 58-81468; May 10, 1983, 58-81469; May 10, 1983, 58-81471

Int. Cl.[4] G06F *1/02, 7/64*

U.S. Cl. 364—720 **16 Claims**

1. A circle generator, comprising:

means for supplying a radius of a circle and start and end angles thereof;

digital differential analyzer (DDA) means coupled to said supplying means for receiving a radius of a circle, and including means for generating x and y coordinates to define a circle having said radius with a center at an origin;

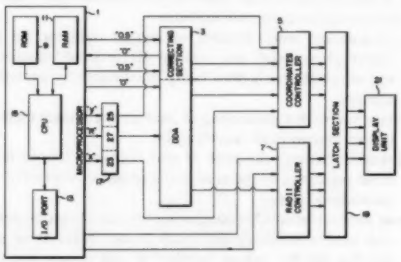
first means coupled at least to said digital differential analyzer means for receiving said radius and one specified coordinate of a target circle center point along one axis of a two-axis system, and including means for performing addition and subtraction with respect to said radius and the one specified coordinate to generate coordinates of rightmost and leftmost points of a target circle along said one axis;

second means coupled to said first means for receiving the one-axis coordinates of the rightmost and leftmost points generated by said first means and another specified coordinate of the target circle center, and including means for providing four points on the target circle that are symmetrical about the center point in accordance with the x and y coordinates generated by said DDA means;

status bit generating means coupled to said supplying means for receiving start and end angles which define circular arcs to be displayed, and including means for generating status bits of respective quadrants of the target circle;

start and end point calculating means coupled to said supplying means for receiving the start and end angles and including means for calculating x and y coordinates of start and end points;

position bit generating means coupled to said start and end point calculating means for receiving outputs from said start and end point calculating means and for receiving said radius, and including means for generating position bits which represent relationships between coordinates of



a current point and the coordinates of the start point, and between the coordinates of the current point and the coordinates of the end point;

determining means coupled to said supplying means, and including means for comparing the start angle with the end angle, and means for determining whether the start angle is larger or smaller than the end angle;

processing means coupled to said status bit generating means and to said position bit generating means, and including means for processing the status bits generated from said status bit generating means and the position bits generated from said position bit generating means, and means for generating enable/disable data which determines whether or not circular arc dots of the responsive quadrants are to be displayed;

inverting means coupled to said processing means and to said determining means to inverting the enable/disable data in accordance with a predetermined result of said determining means; and

display means coupled to said processing means for displaying a dot pattern corresponding to the respective quadrants of the target circle in accordance with the operation of said processing means and said inverting means.

4,692,888

METHOD AND APPARATUS FOR GENERATING AND SUMMING THE PRODUCTS OF PAIRS OF NUMBERS

Bernard J. New, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 3, 1984, Ser. No. 657,563

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—728 **5 Claims**

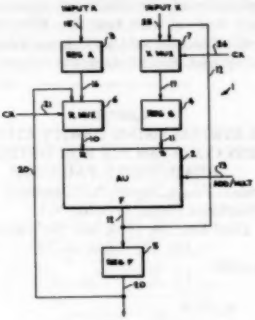
1. A method of generating and summing the products of a

predetermined number of successive pairs of numbers comprising the steps of:

(a) transferring a first pair of said numbers to a first and a second register, respectively;

(b) multiplying the contents of said first and said second registers and storing the product thereof in a third register; thereafter

(c) transferring another pair of numbers to said first and said second registers, respectively; thereafter



(d) multiplying the contents of said first and said second registers and storing the product thereof in said second register; thereafter

(e) adding the contents of said third register and said second register and storing the sum thereof in said third register; thereafter

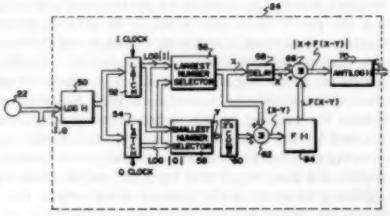
(f) repeating steps (c)–(e) for each remaining pair of said predetermined number of successive pairs of numbers until the contents of said third register comprises the sum of the products of all of said pairs of numbers.

4,692,889

CIRCUITRY FOR CALCULATING MAGNITUDE OF VECTOR SUM FROM ITS ORTHOGONAL COMPONENTS IN DIGITAL TELEVISION RECEIVER

David L. McNeely, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 28, 1984, Ser. No. 655,657
Int. Cl.[4] G06F 7/556
U.S. Cl. 364—730 **12 Claims**



1. Apparatus for generating the magnitude value of the vector sum of a pair of quadrature-related component vectors comprising:

means for receiving the magnitude values I and Q of said pair of quadrature-related component vectors;

means for generating an associated pair of logarithmic values $Log_B |I|$ and $Log_B |Q|$ to a base B;

means for calculating the absolute value |D| of the difference between said logarithmic values $Log_B |I|$ and $Log_B |Q|$;

means for generating a correction value F(|D|) equal to 0.5 $Log_B (1+B^{-2|D|})$;

means including means for determining the larger of said logarithmic values $Log_B |I|$ and $Log_B |Q|$, and for adding the correction value to the larger of the logarithmic values $Log_B |I|$ and $Log_B |Q|$; and

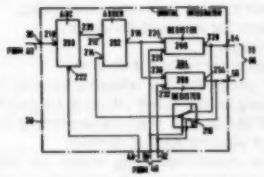
means for producing the antilog of the sum of the correction value and the larger of the logarithmic values $Log_B |I|$ and $Log_B |Q|$, to generate a value C substantially equal to the magnitude of the vector sum of said quadrature-related component vectors.

4,692,890

METHOD AND INTEGRATOR CIRCUIT FOR INTEGRATING SIGNALS, IN PARTICULAR FOR SCINTILLATION GAMMA CAMERA

Roger E. Arseneau, Arlington Heights, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed May 29, 1984, Ser. No. 614,886
Int. Cl.[4] G06F 7/38
U.S. Cl. 364—733 **21 Claims**



3. An integrator circuit for digitally integrating sequentially occurring groups of digital signals, each group including a plurality of sequentially occurring digital signals wherein the first digital signal of a given group occurs at a time after the first digital signal of the group which immediately precedes said given group but not necessarily after the last signal of said immediately preceding group, comprising:

(a) a digital adder having a first digital input for receiving said sequential digital signals to be integrated, a second digital input and a digital output for supplying added digital signals;

(b) a digital storage means including at least first and second digital stores, each store having a digital input connected with the digital output of the adder and having a digital output connected with the second digital input of the adder; and

(c) an integrator control means for controlling the adder and the storage means such that

beginning with said first digital signal of said immediately preceding group, each of said added digital signals from the digital output of the adder are supplied to the first store of said storage means and then supplied form the digital output of the first store of said storage means to the second digital input of the adder for being added to the next succeeding digital signal appearing at the first digital input of the adder and,

beginning with the first digital signal of said given group, each of said added digital signals from the digital output of the adder are supplied to the second store of said storage means and then supplied from the digital output of the second store of said storage means to the second digital

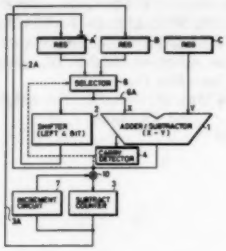
input of the adder for being added to the next succeeding digital signal appearing at the first digital input of the adder.

4,692,891

CODED DECIMAL NON-RESTORING DIVIDER

Akira Yamaoka, Hatano; Kenichi Wada, Sagamihara, and Kazunori Kuriyama, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1984, Ser. No. 668,842
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—763 **16 Claims**



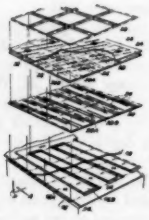
1. A decimal division apparatus comprising:
a first register for storing a dividend;
a second register;
a third register for storing a divisor;
a selection circuit for first selecting a signal from said first register and for thereafter selecting a signal from either of said first and second registers depending on whether or not a first signal is applied thereto;
a subtracter circuit including means for subtracting the signal in said third register from the signal selected by said selection circuit, means for storing the result of subtraction in said first register, and means for generating said first signal when the result of subtraction is not negative;
a shift circuit for shifting the signal selected by said selection circuit by one digit portion, and for storing the shift result in said second register; and
a counting circuit for counting the number of said first signals generated by said generating means.

4,692,892

PARALLEL ANALOG DEVICE FOR THE LOCAL PROCESSING OF A BIDIMENSIONAL SIGNAL

Paul Anizan, A2, Res d'Armor; Daniel Collobert, Ker Skrivell Izellan Ploulec'h, both of 22300 Lannion, and Dominique Massaloux, 109 Rue St Guirec-Ploumanac'h, 22700 Perros-Guirec, all of France

Filed Nov. 7, 1985, Ser. No. 795,839
Claims priority, application France, Nov. 7, 1984, 84 16948
Int. Cl.[4] G06G *7/00*; G06K *9/36*; G02F *1/13*
U.S. Cl. 364—807 **10 Claims**



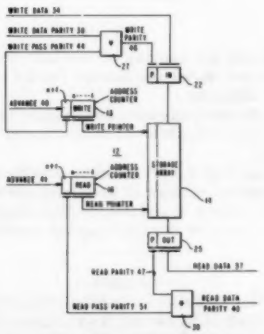
1. An analog parallel device for the local processing of a bidimensional signal comprising a substrate; an input means formed from at least one thin film, said films being deposited and etched on said substrate, said input means receiving said bidimensional signal and supplying a group of parallel electrical input signals to a group of elementary points organized in matrix-like manner; a processing means constituted by at least one thin film, said thin films being deposited and etched on said input means, said processing means receiving said parallel electrical input signals and supplying a group of elementary points organized in matrix-like manner, at least one electrical output signal being obtained by the linear or non-linear combination of a plurality of electrical input signals; and an output means formed from at least one thin film, said films being deposited and etched on said processing means, said output means receiving said parallel electrical output signals.

4,692,893

BUFFER SYSTEM USING PARITY CHECKING OF ADDRESS COUNTER BIT FOR DETECTION OF READ/WRITE FAILURES

Daniel F. Casper, Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,514
Int. Cl.[4] G06F *11/10*
U.S. Cl. 364—900 **6 Claims**



1. A buffer memory system for transmitting a succession of data words between components of a data processing system, comprising,
a buffer memory having 2^n word storage locations addressable by an address of n bits,
means for accessing the buffer memory as a circular queue, said accessing means including a modulo n write address counter, means for forming an intermediate code signifying the parity of a data word to be stored, means for storing a data word and a parity code at the buffer memory location addressed by the write address counter, and means for advancing the write address counter for successive write operations, a modulo n read address counter, means for reading a data word from the location addressed by the read address counter and means for advancing the read address counter, and means for checking parity of a data word read from the buffer memory and signaling an error or the absence of an error,
wherein the improvement comprises,
means connected to the write address counter for identifying alternate passes through the write address counter and the corresponding passes through the buffer memory as odd and even, and means for forming said parity code stored at a buffer location as a predetermined parity function (odd or even) of said intermediate code on an odd write pass and the opposite parity on an even write pass,
means connected to the read address counter for identifying said alternate odd and even passes through the buffer memory and cooperating with said data word parity checking means to check a word read from the buffer

memory during an odd read pass for said predetermined parity and during an even read pass for the opposite parity,

whereby a parity error is signaled by said means for checking parity in case the read operation does not proceed in the same parity sequence as the write operation.

4,692,894

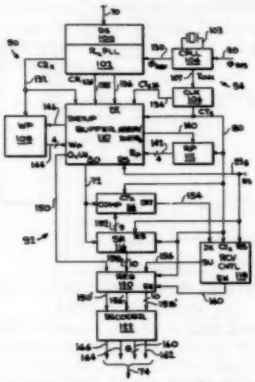
OVERFLOW/UNDERFLOW DETECTION FOR ELASTIC BUFFER

Gerald L. Bemis, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 18, 1984, Ser. No. 683,434

Int. Cl.[4] G06F *13/00*; H04J *3/00*

U.S. Cl. 364—900 **9 Claims**



1. An elastic buffer receiving a first data stream at a first predetermined rate, converting said first data stream to a second data stream at a second predetermined rate, and providing said second stream, said elastic buffer generating a stable buffer overflow/underflow signal, said elastic buffer comprising:

a source of clock signals;

means for generating a plurality of first and a plurality of second read select signals and a plurality of write select signals;

a plurality of addressable storage means connected to said read/write select means each for storing said received data when a predetermined one of said first plurality of read signals is received and for generating signals indicative of said stored data when a predetermined one of said plurality of write signals is received;

wherein said plurality of addressable storage means have addresses arranged in linear numerical order, a currently-read storage means having adjacent storage means corresponding to a storage means last-read and to a storage means next-to-be-read, a second plurality of read select signals corresponding to said currently-read storage means, a first plurality of read select signals corresponding to said last-read storage means, and a third plurality of read select signals corresponding to said next-to-be-read storage means;

a plurality of addressable means connected to said read/write select means and each connected to a predetermined one of said plurality of addressable storage means for generating a bi-level flag signal (Fn) indicative of whether a read or a write was most recently performed on said storage means connected to said flag means; and

means for generating said stable buffer overflow/underflow signal including a plurality of overflow/underflow logic means each receiving said flag (Fn) signal from a predetermined one of said flag means, a predetermined one of said plurality of first read signals and a predetermined one of said plurality of second read signals, and a predetermined one of said write signals for generating a write overflow signal when said flag Fn signal is at a first predetermined level and said write signal is received, and, for generating a read underflow signal when said flag F signal is at a second predetermined level and said second read select signal is received.

4,692,895

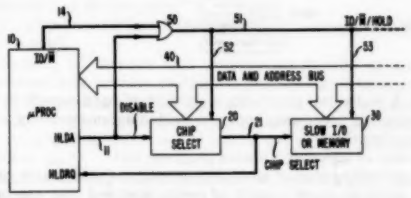
MICROPROCESSOR PERIPHERAL ACCESS CONTROL CIRCUIT

Jacque S. Huffman, Morristown, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 23, 1983, Ser. No. 564,931

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—900 **3 Claims**



1. A microcomputer system comprising:

a microprocessor,

a peripheral data handling device including a chip select input and an IO/$\overline{M}$ input,

a data and address bus interconnecting the microprocessor and the peripheral data handling device

a chip select device coupled to the data and address bus and responsive to selected addresses to enable a chip select input of an addressed device, the peripheral data handling device being one of the devices connected to be enabled by the chip select by having its chip select input enabled,

the microprocessor having a fixed time interval allowance between completion of a data transfer and release of the data bus by the peripheral data handling device during which it is quiescent and the peripheral data handling device having a release time between completion of a data transfer and release of the bus greater than the fixed time interval allowance,

the microprocessor having a hold state which it enters in response to a hold request input signal, the hold state being operative to disconnect the microprocessor from the data and address bus and additionally operative for generating a hold acknowledge signal,

feedback means from the chip select device to apply a hold request input signal to the microprocessor when the peripheral data handling device is being addressed,

the chip select device being coupled to receive and responsive to the hold acknowledge signal applied to remove the hold request input signal to the microprocessor, and

means for supplying a control signal which is applied to the IO/$\overline{M}$ input of the peripheral data handling device during the hold state including means to gate the hold acknowledge signal to the peripheral data handling device as the control signal.

4,692,896

METHOD OF PROCESSING A PLURALITY OF CODE SYSTEMS

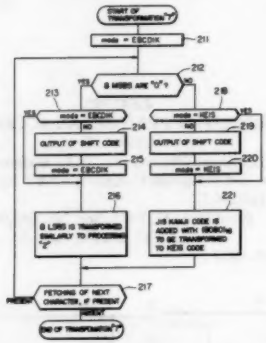
Kousuke Sakoda, Hino; Masahiro Kainaga, Yokohama; Hidehiko Akita, Tokyo; Fumiya Murata, Hadano, and Yoshitake Nakaosa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 752,853

Claims priority, application Japan, Jul. 6, 1984, 59-139002

Int. Cl.[4] G06F *5/00*

U.S. Cl. 364—900 **12 Claims**



1. A method of processing a plurality of code systems in an information processing apparatus including an operating system, comprising:

a step of inputting a source program; and

a compiling step of analyzing meaning of said source program to create a series of instructions and data required for executing processing equivalent to said meaning;

wherein said compiling step including a substep of transforming character type constants to a first code system occupying a region including a first number of bits and transforming character string constants to a second code system occupying a region including a number of bits which is equal to a product of a sum of the number of characters of said character string constants plus one and multiplied with said first bit number so that character type variables designated in said source program correspond, respectively, to the region of said first bit number while a character type array corresponds to a region including a number of bits which is equal to a product resulting from multiplication of said first bit number with the number of elements of said array.

4,692,897

ARRANGEMENT FOR DYNAMIC RANGE CHECKING OR MATCHING FOR DIGITAL VALUES IN A SOFTWARE SYSTEM

Edwin P. Crabbe, Jr., Peoria, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Continuation of Ser. No. 646,728, Sep. 4, 1984, abandoned. This application Jan. 28, 1987, Ser. No. 9,042

Int. Cl.[4] G06F *11/30*

U.S. Cl. 364—900 **9 Claims**

1. In a software development system having a processor, a matcher arrangement comprising:

processor bus means for transmitting dynamically changeable predetermined digital values under control of said processor;

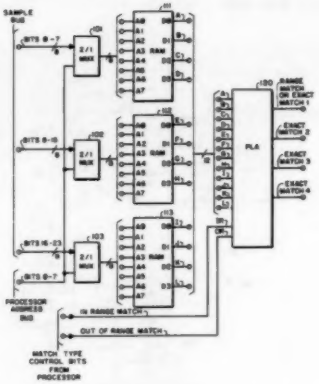
sample bus means for transmitting dynamically changeable digital values;

said processor being operated to provide match control signals on corresponding match control leads;

means for storing connected to said sample bus means and to said processor via said processor bus means, said means for storing being operated in response to said digital values of said processor to retain said dynamically changeable pluralities of predetermined digital values;

said means for storing being further operated to produce one plurality of said predetermined digital values of said processor in response to a comparison of said dynamically changeable digital values transmitted on said sample bus means with said digital values stored in said means for storing by said processor;

programmable logic array means connected to said processor via match control lead and to said means for storing, said programmable logic array means being operated in



response to first values of said match control signals of said processor and to one plurality of said predetermined digital values to produce a range match signal for said digital value of said sample bus means being within a range of said predetermined digital values, said range match signal being transmitted to said processor; and

said programmable logic array means being operated in response to second values of said match control signals of said processor and to said one predetermined digital value to produce at least one of a set of exact match signals for said digital values of said sample bus means being equal to at least one of said stored predetermined digital values, said exact match signals being transmitted to said processor.

4,692,898

BUBBLE MEMORY BIAS FIELD STRUCTURE

Gale A. Jallen, Roseville, and Gene P. Bonnie, Bloomington, both of Minn., assignors to Control Data Corp., Minneapolis, Minn.

Filed Nov. 6, 1980, Ser. No. 204,728

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—27 **3 Claims**

1. A bubble memory structure comprised of:

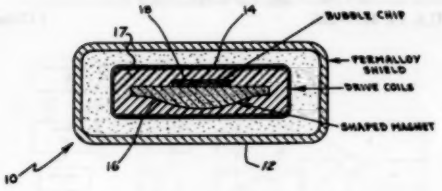
a magnetic field shielding structure,

means for generating a rotating magnetic field within said magnetic field shielding structure,

a bubble memory chip, and

a magnet for generating a bias magnetic field for said bubble memory chip, said magnet consisting of a single element permanent plate magnet of low permeability material placed in continuous, physical, thermal contact with said bubble memory chip and within said means for generating a rotating magnetic field, said magnet further characterized by having a contoured surface disposed opposite a comparatively flat surface in continuous, physical, ther-

mal contact with said bubble memory chip, said contoured surface creating a thicker magnet structure in the central area of the bubble memory chip so that an enhanced magnetic field is created locally and the magnetic field is



essentially uniform over the entire bubble memory device and the magnetic field is stronger in the central area of said magnet than that which would be produced in a uniformly thick device.

4,692,899

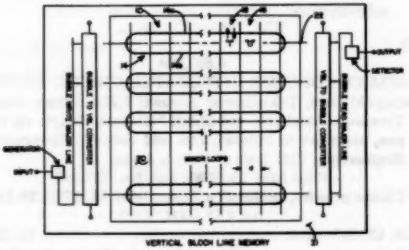
PROPAGATIONAL CONTROL FOR VERTICAL BLOCH LINE MEMORIES

David S. Lo, Burnsville, and Stanley J. Lins, Bloomington, both of Minn., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Dec. 12, 1985, Ser. No. 808,200

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—29 **4 Claims**



1. In a Vertical Bloch Line pair memory comprising at least one elongated storage loop, means for writing Vertical Bloch Line pair storage bits into each of said storage loops, means for propagating said Vertical Bloch Line pair storage bits around each of said storage paths, and means for detecting said Vertical Bloch Line pair storage bits, the improvement comprising a deposited stripe domain magnetic film over said storage loops, and the stripe domain provides contiguous, spatially periodic, parallel, magnetic potential wells, each which have a periodicity in the range of 0.1 to 1 micron wide in the direction along the elongated direction of said storage loops.

4,692,900

SEMICONDUCTOR MEMORY DEVICE HAVING BLOCK PAIRS

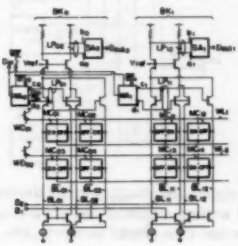
Kazuo Ooami; Yasuhisa Sugo, both of Yokohama, and Tohru Takeshima, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 25, 1985, Ser. No. 715,835

Claims priority, application Japan, Mar. 30, 1984, 59-060600

Int. Cl.[4] G11C *5/06, 29/00*

U.S. Cl. 365—63 **9 Claims**



1. A semiconductor memory device provided with a plurality of blocks, each of said plurality of blocks comprising:

a plurality of bit line pairs;

a plurality of word lines defining intersections with said bit line pairs;

a plurality of memory cells respectively located at said intersections between said bit line pairs and the word lines;

means for writing data into the memory cells of each of said blocks so that complementary data is written in the memory cells of adjacent ones of said bit line pairs of the same block; and

means for reading stored data from the memory cells, said means for reading stored data including a data output terminal for outputting the stored data;

said writing means in each of said blocks has a wiring pattern having a mirror image with respect to that of said writing means in each other one of said blocks that is adjacent thereto, so that logic levels appearing at respective adjacent ones of said bit lines of said adjacent blocks are complementary, and

said reading means in each said block has a wiring pattern having a mirror image with respect to that of said reading means in each other one of said blocks that is adjacent thereto.

4,692,901

SEMICONDUCTOR MEMORY

Masaki Kumanoya; Kazuyasu Fujishima; Hideshi Miyatake; Hideto Hidaka; Katsumi Dosaka, and Yasumasa Nishimura, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,632

Claims priority, application Japan, Aug. 30, 1984, 59-183018; Aug. 30, 1984, 59-183019; Aug. 30, 1984, 59-183020

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—201 **12 Claims**

1. A semiconductor memory comprising:

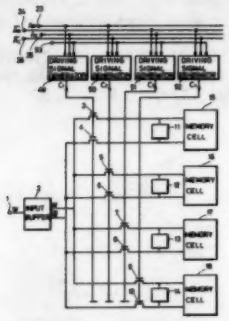
a data writing terminal;

n-bit memory cells coupled in parallel to said data writing terminal, n being an integer not less than 2;

designating signal generating means for generating memory cell designating signals for designating any one of said n-bit memory cells to be written with data;

memory cell writing means of said number n each provided for respective ones of said n-bit memory cells for receiving said memory cell designating signals respectively from said designating signal generating means thereby to write data in designated memory cells; and

driving signal generating means operative during a memory test mode of operation of said memory for generating



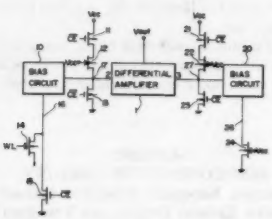
driving signals for simultaneously driving all of said memory cell writing means of said number n to write memory function test data in said memory cells.

4,692,902

SEMICONDUCTOR READ ONLY MEMORY DEVICE WITH IMPROVED ACCESS TIME

Sumio Tanaka, Tokyo; Shinji Saito, Yokohama, and Shigeru Atsumi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1984, Ser. No. 654,215
Claims priority, application Japan, Sep. 26, 1983, 58-177584
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—210 11 Claims



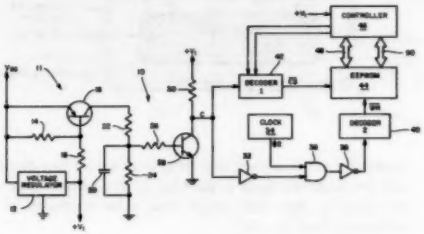
1. A semiconductor memory device comprising:
memory cells storing information;
a bit line connected to said memory cells;
static-type differential amplifier means havig a first input temrinal at which the potential of said bit line is fed as an input, a second input terminal at which a reference potential is fed as an input, and an output temrinal independent of said first and second input terminals, said differential amplifier means comparing potentials fed at said first and second input terminals with each other and detecting information stored in each of said memory cells;
first means responsive to a chip enable inverted signal for discharging said bit line to a predetermined potential level; and
second means responsive to said chip enable inverted signal for discharging said reference potential to substantially the same level as said predetermined potential level.

4,692,903

MEMORY LOSS PROTECTION CIRCUIT

Arthur N. Borg, Lake Forest, and Giora Bar-Hai, River Forest, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 15, 1985, Ser. No. 755,509
Int. Cl.[4] G11C 11/34
U.S. Cl. 365—226 7 Claims



1. For use in a data processing system energized by a line voltage subject to transients, wherein data is written into a nonvolatile memory for storage therein and is read from the nonvolatile memory under the control of a system controller coupled to the nonvolatile memory, a memory protection circuit for preventing the alteration of data stored in the nonvolatile memory arising from line voltage transients comprising:
voltage regulation means coupled to the system controller and responsive to the line voltage for providing a regulated DC voltage to the system controller;
voltage level sensing means coupled across said voltage regulation means for detecting a decrease in the line voltage below a predetermined threshold level and for outputting a control signal in response thereto; and
decoding means coupled to the nonvolatile memory and to said voltage level sensing means and responsive to said control signal for deselecting and write disabling the nonvolatile memory when the voltage across said voltage regulation means drops below said predetermined threshold level in preventing the writing of data into the nonvolatile memory.

4,692,904

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

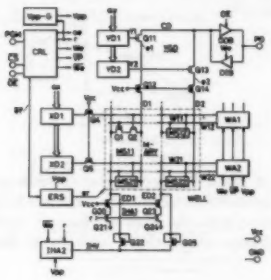
Nobuyuki Sato, Tokorozawa; Kazuaki Ujile, Tokyo; Masaaki Terasawa, Akishima, and Shinji Nabetani, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed May 28, 1985, Ser. No. 737,882
Claims priority, application Japan, May 25, 1984, 59-104629
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—226 16 Claims

1. A semiconductor integrated circuit device comprising:
a memory circuit which includes a memory element for storing data, wherein a voltage equal to greater than a predetermined level is required to be applied to said memory element to change the state of data stored in said memory element;
a voltage converter circuit which receives a power source voltage supplied from a power source through an external terminal as its power source voltage, and which forms an output voltage of a level different from that of said power source voltage, said output voltage being equal to or greater than the predetermined voltage level required to change the state of data stored in said memory element;
means for receiving an external control signal indicative of when data stored in said memory element is to be changed, and for generating a control signal on a control line which control signal changes from a first level to a

second level when the external control signal indicates that the stored data of said memory element is to be changed;

a power source closure detector circuit coupled to said control line and to said power source which power source closure detector circuit assumes a first condition when the power source is closed and which assumes a second condition when the control signal having the first level is produced; and



a control circuit coupled to said power source closure detector circuit, said control circuit including means for preventing the output voltage of said voltage converter circuit from being applied to said memory element during a period in which the power source closure detector circuit is assuming the first condition.

4,692,905

METHOD FOR GEOPHYSICAL PROSPECTING OF COMPLEX OREBODIES

Gennady A. Sobolev; Vladislav M. Demin; Vladimir F. Los, and Zinovy-Jury Y. Maibuk, all of Moscow, U.S.S.R., assignors to Institut Fiziki Zemli Imeni O.Ju. Shmidta Akademii Nauk SSSR, Moscow, U.S.S.R.

PCT No. PCT/SU84/00048, § 371 Date Apr. 11, 1986, § 102(e) Date Apr. 11, 1986, PCT Pub. No. WO86/01609, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 21, 1984, Ser. No. 863,380

Int. Cl.[4] G01V *3/00*

U.S. Cl. 367—14 **1 Claim**

1. A method for geophysical prospecting comprising the steps of exciting, at least two times, elastic waves in ground containing orebodies and recording arrival time of a first pulse of each pulse train of electromagnetic radiation in the radio frequency range generated by the orebodies, the number of these pulse trains during each excitation being equal to the number of orebodies, characterized by recording the arrival time of the last pulse of each pulse train (1,2,3,4,5,6) resulting from each excitation of elastic waves, then calculating the difference between the maximum arrival time of the last pulses and the minimum arrival time of the first pulses of the pulse trains (1,3,5 and 2,4,6) representing one orebody, and determining, based on said difference, the thickness of said one orebody.

4,692,906

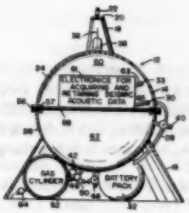
OCEAN BOTTOM SEISOMETER

Walter P. Neeley, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 568,305, Jan. 4, 1984, abandoned. This application Dec. 13, 1985, Ser. No. 808,704

Int. Cl.[4] G01V *1/38*

U.S. Cl. 367—15 **16 Claims**



1. An improved ocean bottom seismometer comprising:

a spherical-shaped main housing having a seismic acquisition portion and a ballast portion below said acquisition portion, said ballast portion controlling ascent and descent of said ocean bottom seismometer;

a conical skirt fixed to said main housing elevating said main housing above a horizontal plane coincident with a base of said skirt, said skirt capable of confining fluid under said main housing when said base rests on an ocean bottom;

a plurality of spherical compartments mounted inside said skirt; and

a lifting hook mounted on the outside of said main housing.

4,692,907

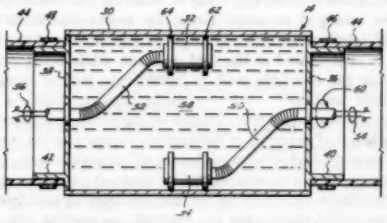
MEANS FOR MAINTAINING A FIXED RELATIVE ORIENTATION OF TWO SENSORS

Paul Jubinski, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Continuation of Ser. No. 679,813, Dec. 10, 1984, abandoned. This application Sep. 26, 1986, Ser. No. 911,718

Int. Cl.[4] G01V *1/18*; H01K *17/00*

U.S. Cl. 367—20 **11 Claims**



11. A sensor module adapted for use in a seismic cable comprising:

an enclosed housing;

a volume of fluid within said housing;

a first sensor unit having a specific gravity less than the specific gravity of said fluid and deployed within said housing so that said first sensor unit floats at the top of said fluid as the orientation of said housing changes;

a second sensor unit having a specific gravity greater than the specific gravity of said fluid and deployed within said housing so that said second sensor unit remains at the

bottom of said fluid as the orientation of said housing changes;

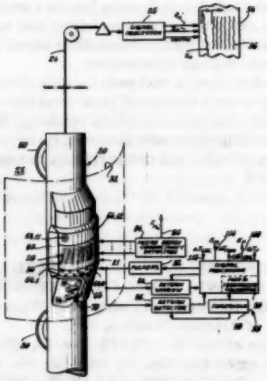
a first and second flexible tether securing said first and second sensor units, respectively, to opposite ends of said housing, said tethers including signal conductors for coupling signal from said sensor units to the exterior of said housing.

4,692,908

METHOD AND APPARATUS FOR INVESTIGATING STAND-OFF IN A BOREHOLE

Michael P. Ekstrom, Redding, and R. Mark Havira, New Fairfield, both of Conn., assignors to Schlumberger-Doll Research, Ridgefield, Conn.

Filed Mar. 24, 1982, Ser. No. 361,224
Int. Cl.[4] G01V *1/00, 3/02;* G01U *3/04;* H04B *17/00*
U.S. Cl. 367—27 28 Claims



1. A method for investigating an earth formation penetrated by a borehole with a tool having a segment which is provided with a laterally extending array of small current emitting electrodes arranged to make resistivity measurements in such spatial relationship that a contiguous lateral area of the borehole is investigated as the tool segment, while being pressed towards the borehole wall, is operatively moved along the borehole wall, said electrodes being sized to enable a high resolution resistivity investigation of the earth formation with a resolution of the order of millimeters, comprising the steps of:

generating high resolution beams of acoustic energy in the form of pulses and directing these at segments of the borehole wall from places that are from at least laterally separated places that are generally in vertical alignment with the array of electrodes and are pressed with the array towards the borehole wall;

detecting at said places acoustic reflections originating from the borehole wall segments and caused by said pulses of acoustic energy; and

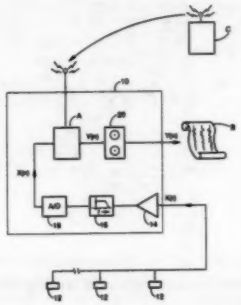
deriving from the detected acoustic reflections acoustic travel times indicative of the magnitude of tool standoff at said places as well as lateral tool lift-off at said array of electrodes with an accuracy and resolution sufficient to resolve, in said resistivity measurements, ambiguities attributable to stand-off, and vertical and lateral tool tilt.

4,692,909

ADAPTIVE SEISMIC SIGNAL PROCESSOR

Michael F. Gard, Catoosa, Okla.; Ralph E. Warmack, Kingwood, Tex.; Kyong H. Lee, Albuquerque, and Robert H. Maschhoff, Cedar Crest, both of N. Mex., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 29, 1984, Ser. No. 626,491
Int. Cl.[4] G01V *1/22, 1/36*
U.S. Cl. 367—45 9 Claims



1. An adaptive seismic signal processor with a portable seismic data acquisition unit for providing a plurality of sampling rates for recording digitized seismic signals in the portable seismic data acquisition unit, comprising:

processor means with the seismic data acquisition unit for sampling digitized seismic signals at a plurality of sampling rates and for passing cooperatively coupled frequency domains of the sampled digitized seismic signal so as to preclude the generation of alias frequencies, wherein pass band frequency domains are determined from a set of digital filter coefficients;

programmable memory means with the seismic data acquisition unit for storing a plurality of sets of filter coefficients for determining pass band frequency domains; and

selector means with the seismic data acquisition unit responsive to command signals from a remote location for selecting one of the plurality of sampling rates and for addressing one of the sets of filter coefficients in the programmable memory means to the processor means whereby the processor means samples and passes a cooperatively coupled pass band frequency domain of the digitized seismic signal.

4,692,910

METHODS OF DETERMINING LITHOLOGICAL CHARACTERISTICS OF AN UNDERGROUND FORMATION WHICH UTILIZE COMPRESSIONAL VELOCITY AND SHEAR VELOCITY DATA

Carl H. Sondergeld; Albert L. Frisillo, both of Broken Arrow, and Janice O. Norris, Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

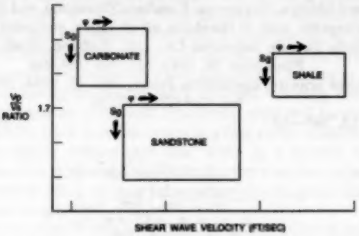
Filed Mar. 11, 1985, Ser. No. 711,115
Int. Cl.[4] G01V *1/28*
U.S. Cl. 367—75 8 Claims

1. A method of determining the formation material type at a particular location in an underground formation by utilizing compressional velocity data (V_p) and shear velocity data (V_s), comprising:

(a) calculating bulk velocity (V_B) utilizing V_p and V_s data wherein

$$V_B = (V_p^2 - (4/3)V_s^2)^{\frac{1}{2}} = \left[\frac{\text{bulk modulus } (K)}{\text{density } (\rho)}\right]^{\frac{1}{2}};$$

(b) plotting V_B on one axis and V_P on a second axis to define a field of data points, wherein each data point corresponds to a particular location in the underground formation;



(c) including velocity boundaries of V_B and V_P within the plot of (b) for at least one formation material type; and

(d) determining from the position of a data point relative to the velocity boundaries, the formation material type.

4,692,911

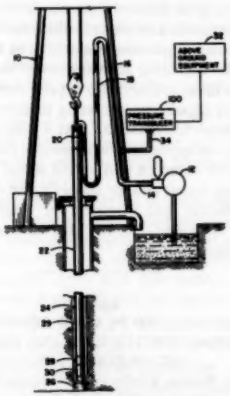
METHODS AND APPARATUS FOR REDUCING INTERFERING EFFECTS IN MEASUREMENT WHILE DRILLING OPERATIONS

Serge A. Scherbatskoy, 3921 Clayton Rd. E., Fort Worth, Tex. 76116

Continuation of Ser. No. 389,469, Jun. 17, 1982, which is a division of Ser. No. 110,848, Jan. 10, 1980, Pat. No. 4,351,037, which is a division of Ser. No. 857,677, Dec. 5, 1977, abandoned. This application Jun. 25, 1986, Ser. No. 878,425

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—83 **29 Claims**



1. A telemetering arrangement for use in conjunction with drilling operations of a borehole for transmitting information expressed in terms of data signals and employing a fluid circulation system including mud pump means wherein interfering signals having a distinguishable characteristic are produced, said distinguishable characteristic resulting from pressure changes which are induced in the fluid of said circulation system by the drilling operations and are recurrent in accordance with an identifiable pattern, and wherein said circulation system forms at least in part a communication channel between a transmitting means at a first location for transmitting data signals representing said information, and a signal receiving means at a second location, said signal receiving means being operable to receive a mixture of said data signals and of said interfering signals to produce electrical mixed signals representing said mixture, said arrangement comprising,

means operable independent of transmission properties of any portion of said circulation system for producing electrical control signals representative of said identifiable pattern,

electronic processing apparatus comprising signal extractor means to which said electrical mixed signals are applied, and which is controlled by said electrical control signals to produce processed signals in which interfering signals are diminished, and

means for deriving said information from said processed signals.

4,692,912

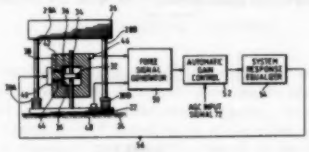
AUTOMATIC FORCE CONTROL FOR A SEISMIC VIBRATOR

Allan H. Mueller, Houston; Dean P. Perkins, Pasadena, and Rhys M. Evans, Houston, all of Tex., assignors to Geosource, Inc., Houston, Tex.

Filed Nov. 30, 1984, Ser. No. 676,718

Int. Cl.[4] H04R *23/00*

U.S. Cl. 367—190 **13 Claims**



9. A hydraulic seismic vibrator, comprising:

a baseplate;

a reaction mass;

an electrohydraulic mechanism responsive to an electrical input signal for actuating said baseplate;

means for generating a first signal representative of the force of said baseplate when said vibrator is actuated;

means for generating a second signal representative of the integral of the absolute value of said first signal over a sample time period including at least one cycle;

means for comparing said second signal to a reference value;

means for generating an error signal in response to said comparison between said second signal and said reference value; and

means for correlating said error signal and said electrical input signal to generate a drive signal to actuate said baseplate.

4,692,913

METHOD AND APPARATUS FOR READING A DATA RECORD CARRIER

Richard Ackerman, Fremont, Calif.; Donovan W. Hurlbut, Whitewater, and Alan A. Jewer, Ft. Atkinson, both of Wis., assignors to News Log International, Inc., Janesville, Wis.

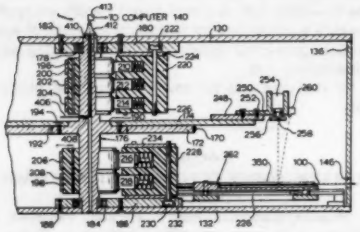
Continuation-in-part of Ser. No. 210,847, Nov. 26, 1980, Pat. No. 4,416,001. This application Nov. 14, 1983, Ser. No. 551,638 The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.[4] G11B *7/09*

U.S. Cl. 369—44 **29 Claims**

1. A method of reading data from a data record carrier on which data has been recorded in arcuately nested, equal radii data rows which are equally spaced apart along a common centerline that is coextensive with a radius for each data row, comprising the steps of: incrementally moving the data record carrier in steps transversely of the data rows; projecting a light beam onto the plane in which the data record carrier moves; rotating the light beam about an axis parallel to the axis of said light beam to rotate said light beam in an arcuate path across

the data record carrier, the radius of the arcuate path being the same or approximately the same radius of each data row; detecting scattered light outside the cone of specular reflection from the light beam impinging on the data record carrier, or the lack of scattered light, as the light beam traverses each data



row; and sensing, and correcting for, difference between the arcuate path of said light beam and the arcuate path of the data row being traversed by said light beam to ensure that said light beam traverses approximately the same arc as that of each data row.

4,692,914

REPRODUCING DEVICE FOR FREQUENCY MODULATED SIGNALS

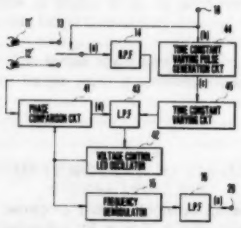
Hiroto Yasumura, Kanagawa; Susumu Kozuki, Tokyo, and Masahiro Takei, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,785

Claims priority, application Japan, May 31, 1983, 58-97276; May 31, 1983, 58-97277; Jul. 6, 1983, 58-123700; Jul. 15, 1983, 58-129247

Int. Cl.[4] G11B *20/24*

U.S. Cl. 369—49 **10 Claims**



1. A reproducing device for a frequency modulated signal, comprising:

(a) reproducing means for reproducing a frequency modulated signal from a recording medium;

(b) demodulating means for frequency demodulating a signal reproduced by said reproducing means;

(c) generating means for generating a pilot signal relative to a discontinued part of the signal reproduced by said reproducing means;

(d) removing means for removing a high frequency zone of a signal produced from said demodulating means; and

(e) control means for controlling in accordance with said pilot signal the frequency zone which is to be removed by said removing means.

4,692,915

RECORDING AND REPRODUCTION APPARATUS HAVING IMPROVED RELIABILITY WITH RESPECT TO EXTERNALLY APPLIED VIBRATION OR IMPACT

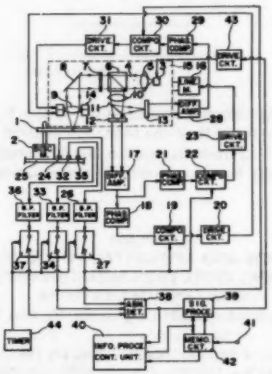
Mitsuro Moriya, Neyagawa; Kazuharu Shiragami, and Hiroyuki Yamaguchi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 28, 1985, Ser. No. 738,464

Claims priority, application Japan, Jun. 15, 1984, 59-123000

Int. Cl.[4] G11B *27/36*

U.S. Cl. 369—53 **19 Claims**



11. A recording and reproduction apparatus which includes means such that a light beam which converged and projected onto a recording medium is displaceable in a direction parallel to a surface of the recording medium and perpendicular to a track thereon so as to record signals on the track or to reproduce signals recorded on the recording medium, said recording and reproduction apparatus comprising an acceleration detecting means for detecting acceleration of the apparatus due to vibrations or impacts externally applied thereto and for supplying an output signal corresponding thereto, an abnormal state detecting means for detecting that a magnitude of the vibrations or impacts applied to the apparatus has exceeded a predetermined value based on said output signal from said acceleration detecting means and for supplying an output signal corresponding thereto, and a means for inhibiting recording in accordance with said output signal from said abnormal state detecting means.

4,692,916

DISC-RECORD PLAYER COMPRISING A DISC-LOADING MECHANISM AND DISC-HOLDER FOR USE IN SUCH A PLAYER

Petrus L. A. Rouws, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 617,066, Jun. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 571,225, Jan. 16, 1984, abandoned. This application Dec. 13, 1985, Ser. No. 808,664

Claims priority, application Netherlands, Jun. 15, 1983, 8302130

Int. Cl.[4] G11B *17/04, 23/02*

U.S. Cl. 369—75.2 **15 Claims**

1. A disc-record player comprising:

(a) a housing;

(b) a chassis supported in said housing;

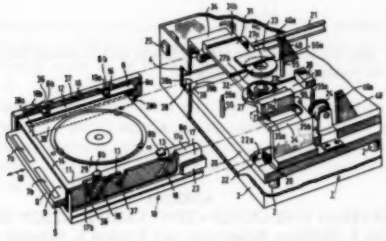
(c) a turntable rotatably mounted on said chassis, the axis of rotation of said turntable defining an axial direction;

(d) a disc reading means displaceably mounted on said chassis;

(e) a loading mechanism for loading a disc onto said turntable comprising;

(i) a disc holder for holding said disc prior to loading, said disc holder having a cylindrical wall defining a cylindrical space of circular cross section for receiving said disc, said space being completely open toward an upper side of the holder, said disc holder having an opening formed in a lower side, said disc holder having at least one spring-loaded, radially movable latching element arranged adjacent said cylindrical wall and formed to axially latch said disc when in a first radial position and to axially release said disc when in a second radial position, and said disc holder having a surface adjacent each latching element for axially supporting said disc on one side;

(ii) a frame provided with guide means for slidably receiving said disc holder, said frame being axially movable relative to said chassis between an upper position corresponding to said disc not being loaded on said turntable and a lower position corresponding to said disc being loaded on said turntable, said opening formed in the lower side of said disc holder being arranged such that said turntable extends therethrough when said frame is in said lower position;



(iii) a pressure member which is axially movable relative to said chassis for pressing said disc against said turntable; and

(iv) control means for controlling the axial movements of said frame and said pressure member; and

(f) at least one release element axially upwardly directed relative to said chassis;

wherein at least one pair of latching and release elements is arranged such that each latching element is radially displaced by said corresponding release element as said frame is moved to its lower position, following which said disc is released and cleared from said disc holder and urged against said turntable by said pressure member.

4,692,917

PACKET SWITCHING SYSTEM

Masanobu Fujioka, Tokyo, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,116

Claims priority, application Japan, Nov. 27, 1984, 59-248781

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **6 Claims**

1. A packet switching system comprising:

a plurality of incoming circuits;

a plurality of outgoing circuits;

a plurality of packet handlers, one for each incoming circuit;

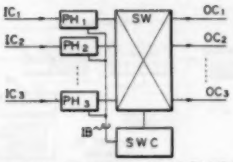
a cross-point switch of circuit switching capability to connect and switch the incoming circuits and the outgoing circuits through the packet handlers;

a switch controller to select idle circuits in the desired outgoing routes and to control the establishment, and release of the connections of the cross-point switch; and

an internal bus to transfer control information signals between each of the packet handlers and the switch controller;

wherein each of the packet handlers processes the header of each incoming packet from the corresponding incoming circuit, analyzes the routing information included in the header so as to determine an outgoing route for the packet and transfers to the switch controller through the internal bus a request for the connection of the packet handler and one of the outgoing circuits in the outgoing route;

the switch controller, upon receipt of the connection request from the packet handler, connects one of the outgoing circuits in the outgoing route and the packet handler through the cross-point switch and transfers a connection completion signal to the packet handler through the internal bus;



(a) FUNDAMENTAL STRUCTURE OF SWITCHING SYSTEM

the packet handler, upon receipt of the connection completion signal, transmits the data field following the header of the packet to the above-mentioned outgoing circuit and after the completion of transmission of the entire packet, transfers a transmission completion signal to the switch controller through the internal bus; and

the switch controller repeats the establishment and the release of the connection, between each of the packet handlers and one of the outgoing circuits by opening and closing the cross-point switch for each packet,

wherein only a part of the packet is stored in the switching system and the switching of the packet is performed by a circuit switching operation.

4,692,918

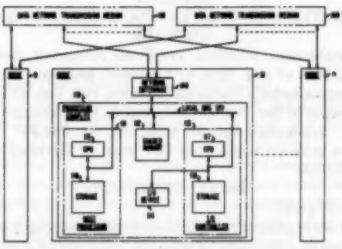
RELIABLE LOCAL DATA NETWORK ARRANGEMENT

Roger A. Elliott, Naperville, and Wayne V. Lindquist, Lisle, both of Ill., assignors to AT&T Bell Laboratories, Murray Mill, N.J.

Filed Dec. 17, 1984, Ser. No. 682,096

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—85 **28 Claims**



1. In a distributed processing system comprising a plurality of processor complexes, each complex comprising at least one processor, means for transmitting data packets among said processor complexed comprising:

two local data network transmission media; and

a network interface uniquely associated with and connected to each of said processor complexes and connected to both of said transmission media for conveying operational

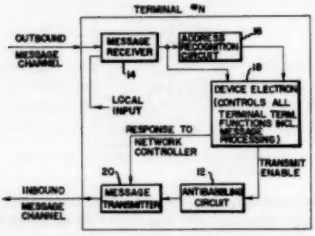
data packets between the associated processor complex and one of said transmission media and comprising a maintenance processor for receiving control data packets from the other of said transmission media and responsive to received control data packets for controlling maintenance operations of said network interface.

4,692,919

COMMUNICATIONS NETWORK

Lamar E. West, Jr., Maysville, Ga., assignor to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Nov. 29, 1985, Ser. No. 802,488
Int. Cl.[4] H04J *3/16*
U.S. Cl. 370—96 **9 Claims**



1. In a communications network having a plurality of terminals which transmit and receive messages over a common communication channel for predetermined intervals and with a predetermined frequency in a sequence determined by control signals from a controller which is connected to the common channel and enables said terminals to have access to said channel, an improved terminal which comprises means responsive to said control signals for providing an enable signal, means for transmitting messages local to said terminal onto said channel, means responsive to said enable signal for enabling said means for transmitting its local messages, and means included in said last named means for inhibiting a response to said enable signal which would enable said means for transmitting its local messages for a period substantially greater than the predetermined interval in each said sequence or at a frequency substantially greater than the predetermined frequency in each said sequence.

4,692,920

APPARATUS FOR GENERATING PATTERNS OF TEST SIGNALS

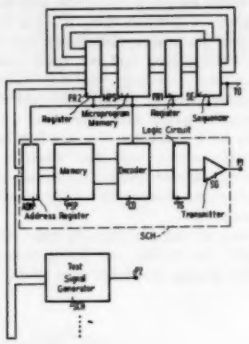
Rolf Tannhaeuser, Krailling, and Franz Herrmann, Schemmerhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 528,646, Sep. 1, 1983, abandoned. This application Apr. 30, 1986, Ser. No. 859,847
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237365
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 **9 Claims**

1. An arrangement for generating and applying patterns of test pulses to a plurality of terminal elements of a unit under test, comprising:

a plurality of test signal generators each storing respective test signals in coded form, and each connected to a respective terminal element, and each comprising storage means storing the test signals in coded form and generating means responsive to the coded test signals to generate the patterns of test signals; and

an address control connected to said plurality of test signal generators and operable to sequentially address the storage means thereof to cause the respective generating



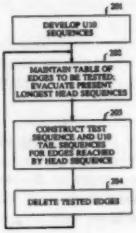
meeans to generate test signals at said terminal elements in a predetermined sequence.

4,692,921

METHOD FOR GENERATING VERIFICATION TESTS

Anton T. Dahbura, Bedminster, and Krishan K. Sabnani, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1985, Ser. No. 768,500
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 **7 Claims**


DEVELOP U10 SEQUENCES
MAINTAIN TABLE OF EDGES TO BE TESTED; EVACUATE PRESENT LONGEST HEAD SEQUENCES
CONSTRUCT TEST SEQUENCE AND U10 TAIL SEQUENCES FOR EDGES REACHED BY HEAD SEQUENCE
DELETE TESTED EDGES

1. A method for developing test sequences for evaluating a design or operation of a finite state machine characterized by a state diagram having states and edges interconnecting such states, comprising:

a step of evaluating unique input/output sequences for states of said finite state machine;

a step of evaluating a head sequence for a selected edge of said finite state machine, said edge having a head state and a tail state, wherein said head sequence places said finite state machine in said head state;

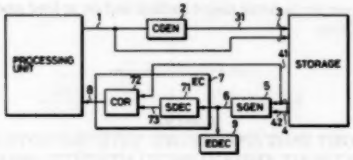
a step of constructing a test sequence for said selected edge by concatenating said head sequence with an input/output sequence characteristic of said edge and with a unique input/output sequence of said tail state derived from said step of evaluating unique input/output sequences; and

returning to said step of evaluating a head sequence for another selected edge of said finite state machine until all edges of said finite state machine have been selected.

4,692,922
METHOD FOR CORRECTING AND DETECTING ERRORS

Yoshio Kiriu; Shigeru Kaneko, and Hiroshi Kosuge, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,682
Claims priority, application Japan, Dec. 12, 1984, 59-260709
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—37 12 Claims



1. A method for correcting and detecting error caused in a unit of information which consists of plurality of blocks each block being made up of (b) bits, said method comprising the steps of:

generating check bits from said unit of information on the basis of a parity matrix which consists of a plurality of partial matrices, each partial matrix including a b×b matrix Xq (q=1 to b) which is obtained by rotating each row of a b×b matrix

$$\begin{bmatrix} 1 & 1 & 1 & \cdots & 1 \\ 1 & & & & \\ & 1 & & & \\ & & \cdot & & \\ & & & \cdot & \\ & & & & 1 \end{bmatrix}$$

along the column direction by a number (q) and each partial matrix being acted upon for each corresponding block;

generating a syndrome from said unit of information and said check bits on the basis of said parity matrix;

decoding said generated syndrome on the basis of said parity matrix to indicate an error bit position of said unit of information;

correcting an error from said unit of information and said error bit position thereof to complete said unit of information free from correctable error; and

detecting an uncorrectable error by decoding said generated syndrome on the basis of said parity matrix.

4,692,923
FAULT TOLERANT MEMORY

Alan D. Poeppelman, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

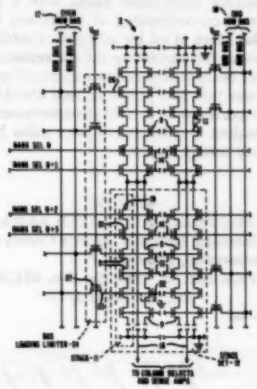
Filed Sep. 28, 1984, Ser. No. 655,854
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—38 17 Claims

1. A memory array having addressable data storage cells and comprised of:

a first section, having first and second subsections and providing information for a first data bit position upon addressing by first and second select signals;

a second section, having first and second subsections and providing information for a second data bit position upon addressing by first and third select signals;

signal means for providing first select signals to address the subsections of the first and second sections, second select signals to address alternate subsections of the first section,

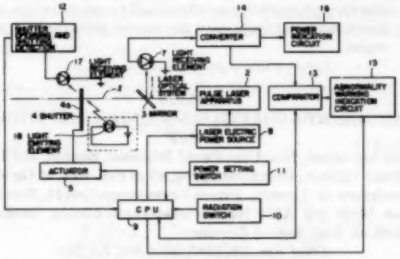


and third select signals to address alternate subsections of the second section.

4,692,924
LASER TREATMENT APPARATUS

Hiroshi Koizumi, Saitama; Masatsugu Kijima, and Sinya Tanaka, both of Tokyo, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 783,967
Claims priority, application Japan, Oct. 6, 1984, 59-150720[U]
Int. Cl.[4] H01S 3/13
U.S. Cl. 372—30 16 Claims



1. A laser treatment apparatus comprising:

a laser source for generating a treatment pulse beam;

a laser optical path for guiding said treatment laser pulse beam toward an object to be treated thereby;

a power setting means for controlling said laser source to set the power output of said treatment laser pulse beam;

a radiation switch for selectively switching said laser source to output said treatment laser pulse beam or to stop the output of said treatment laser pulse beam;

a safety device for enabling said laser source to output a checking laser pulse beam prior to the transmission of said treatment laser pulse beam through said laser optical path and after the activation of said radiation switch to select the output of said treatment laser pulse beam, said checking laser pulse beam having a power corresponding to the actual power of said treatment laser pulse beam outputted by said laser source;

a power detector for detecting the power output of said

checking laser pulse beam outputted from said laser source; and

a comparator for comparing said detected power output of said checking laser pulse beam with a predetermined power level corresponding to the power of a treatment laser pulse beam as set by said power setting means, said safety device for preventing the transmission of said treatment laser beam from said laser source if said comparator determrines that said power of said checking laser pulse does not correspond to said predetermined power level corresponding to a treatment laser pulse beam as set by said power setting means.

4,692,925

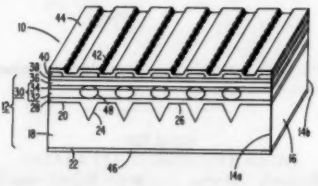
PHASE-LOCKED LASER ARRAY

Dan Botez, Randolph Township, Morris County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 13, 1984, Ser. No. 681,206

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **6 Claims**



1. In a phase-locked laser array including a body of semiconductor material having therein a cavity region and means for defining a plurality of substantially parallel lasing zones in said cavity region, said zones being spaced an effective distance apart so that the modes of oscillation in adjacent lasing zones are phase-locked to one another, and first and second electrodes on said body;

the improvement wherein said first electrode comprises a plurality of spaced apart electrically connected electrical contacts to said body over the regions between said lasing zones.

4,692,926

MUSHROOM-SHAPED SEMICONDUCTOR STRIPE LASER

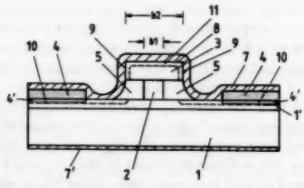
Peter Marschall, Neu-Ulm; Ewald Schlosser, Senden, and Hans-Peter Vollmer, Brandenburgweg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main and ANT Nachrichtentechnik GmbH, Backnang, both of, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 727,251

Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419600

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **19 Claims**



1. A mushroom-shaped semiconductor stripe laser, particularly with transversal, monomode light distribution comprising: a semiconductor double heterostructure including a semiconductor substrate of one conductivity type, a stripe-shaped semiconductor laser-active zone disposed on one major surface of said substrate and a stripe-shaped semiconductor cover layer of the opposite conductivity type disposed on the outer surface of said laser-active zone, said laser-active zone having a width which is less than the width of said cover layer, as a result of said cover layer being underetched, so as to form a mushroom-shaped structure with the ratio of said width of said cover layer to said width of said laser-active zone lying in a range between two and five; a metal ohmic contact on the other major surface of said substrate; and a metal layer ohmically contacting said cover layer on its outer major surface and on at least one of its side surfaces.

4,692,927

LIGHT EMITTING DEVICE WITH IMPROVED ELECTRODE STRUCTURE TO MINIMIZE SHORT CIRCUITING

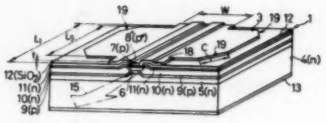
Masaaki Sawai, Takasaki; Masamichi Kobayashi, Maebashi; Shoji Hayashi, Takasaki; Hiroshi Naka, Komoro, and Masahiro Ichiki, Tamamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,029

Claims priority, application Japan, Mar. 16, 1984, 59-49033; Apr. 13, 1984, 59-72819

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **15 Claims**



1. A light emitting device comprising:

(1) a semiconductor block consisting essentially of:

(a) a first main plane;

(b) a second main plane facing said first main plane;

(c) a first end surface interposed between said first and second main planes;

(d) a second end surface facing said first end surface and interposed between said first and second main planes;

(e) a first side wall interposed between said first and second main planes and said first and second end surfaces;

(f) a second side wall facing said first side wall and interposed between said first and second main planes and said first and second end surfaces; and

(g) a light emitting region having one of the ends thereof exposed on said first end surface and the other end thereof exposed on said second end surface, wherein said second main surface has a periphery including end peripheral edges at intersections of said second main surface and said first and second end surfaces and side peripheral edges at the intersections of said second main surface and said first and second side walls; and

(2) an electrode consisting essentially of:

(a) a first electrode portion disposed on said second main plane of said semiconductor block along said light emitting region, and having the width thereof greater than the width of said light emitting region; and

(b) a second electrode portion disposed on said second main plane of said semiconductor block, connected completely integrally with said first electrode portion, and having a periphery thereof recessed along said second main plane to be out of contact from both the end peripheral edges and the side peripheral edges of the periphery of said second main plane.

4,692,928

METHOD FOR IMPROVING THE POWER OF AN AXIAL GAS LASER

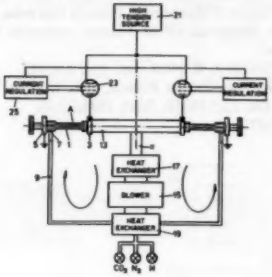
Hardy P. Weiss, Hütten, Switzerland, assignor to PRC Corporation, Landing, N.J.

Filed Oct. 10, 1985, Ser. No. 786,058

Claims priority, application Switzerland, Oct. 10, 1984, 4861/84

Int. Cl.⁴ H01S *3/03*

U.S. Cl. 372—63 **22 Claims**



1. In a method of lasing gas in a fast axial flow gas transport laser comprising generating a flow of a gas along an excitation tube and wherein said gas is loaded with thermal energy increasing in the flow direction of said gas within said excitation tube and wherein said flow of gas forms within cross-sections of said tube a circumferential low speed, speed dependent boundary layer and a central area of higher speed gas flow, the improvement comprising enlarging the thermal energy applicable to said gas per massflow unit of said gas through said tube by controlling at least along a part of said tube the extent of said central area by steadily varying the cross-section area of said tube at least along said part to compensate for said circumferential low speed boundary layer.

4,692,929

SELF-BAKING ELECTRODE FOR ELECTRIC ARC FURNACES AND THE LIKE

Mario Cavigli, Mestre, Italy, and Lorenzo Ferrari, Lugano, Switzerland, assignors to Kinglor-LTD, Lugano, Switzerland

PCT No. PCT/EP85/00504, § 371 Date May 19, 1986, § 102(e) Date May 19, 1986, PCT Pub. No. WO86/02800, PCT Pub. Date May 9, 1986

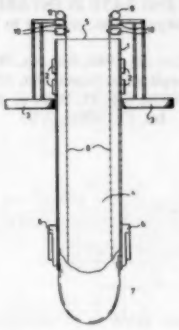
PCT Filed Sep. 30, 1985, Ser. No. 871,432

Claims priority, application European Pat. Off., Oct. 23, 1984, 84112756.6

Int. Cl.⁴ H05B *7/09*

U.S. Cl. 373—89 **8 Claims**

1. A self-baking electrode for electric arc furnaces comprising a containing and guiding metal casing, an electrodic carbonaceous mass flowing in said containing casing, and a supporting structure for said electrodic mass, said supporting structure



being composed of braided carbon fibres arranged in a manner so as to form a supporting element for said carbonaceous mass.

4,692,930

FLOOR OF ELECTRICALLY HEATED MELTING FURNACE, PARTICULARLY A DIRECT CURRENT FURNACE

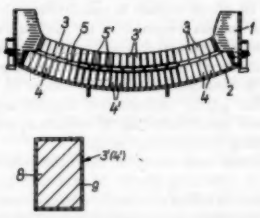
Dietrich Radke, Ratingen; Peter Meger, Willich, and Heinz Zörcher, Siegen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 912,913

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534750

Int. Cl.⁴ F27D *1/04*

U.S. Cl. 373—72 **17 Claims**



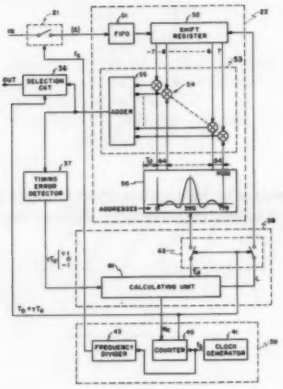
1. In an electrically heated melting furnace, particularly a direct current furnace, having a floor provided with a lining of refractory material and with an electrode comprised of a plurality of electrically conductive paths which extend through said lining of refractory material starting from the inner surface of the floor and continuing toward the exterior; the improvement wherein said conductive paths are composed of layers of at least one high melting point, electrically conductive, nonmetallic material which are connected with said refractory material, and which have a thickness of at most 5 mm.

4,692,931

SYNCHRONIZATION CIRCUIT CAPABLE OF ESTABLISHING SYNCHRONISM EVEN WHEN A SAMPLING RATE IS INVARIABLE

Tomoki Ohsawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 30, 1985, Ser. No. 792,765
Claims priority, application Japan, Oct. 31, 1984, 59-229508; Mar. 14, 1985, 60-50936; Sep. 11, 1985, 60-202365
Int. Cl.[4] H04L 7/00
U.S. Cl. 375—106 5 Claims



1. A synchronization circuit responsive to an input signal carrying a transmission data signal and being received at a transmission rate for producing an output signal which is representative of reproductions of said transmission data signal, said circuit comprising:

sampling means responsive to said input signal for sampling it at a predetermined sample rate to produce a sequence of sampled signals at said predetermined sample rate;

interpolating means coupled to said sampling means for interpolating said sampled signal sequence to produce an interpolated signal sequence; and

processing means coupled to said interpolating means for processing said interpolated signal sequence to produce said output signal at said transmission rate;

said interpolating means comprising:

storage means for successively storing said sampled signal sequence at said predetermined sample rate to produce a sequence of stored signals at said transmission rate;

interpolation means responsive to said stored signal sequence and to first and second control signals for interpolating said stored signal sequence with reference to said first and second control signals in order to produce first and second partial interpolated signals and responsive thereto said interpolated signal sequence; and

said processing means comprising:

detection means responsive to said interpolated signal sequence for detecting phases of said first partial interpolated signals in relation to said sampling rate to produce a sequence of phase signals which are representative of said phases;

calculating means responsive to said phase signals for calculating first and second internal control signals related to said first and second partial interpolated signals, respectively; and

reference timing signal generating means operatively coupled to said detection means for generating a sequence of reference timing signals with reference to the phases of said first partial interpolated signals; and

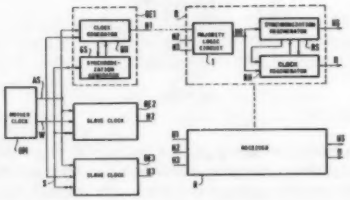
delivery means coupled to said calculating means and said interpolation means for delivering said first and second internal control signals to said interpolation means as said first and second control signals, respectively.

4,692,932

TRIPLICATED CLOCK DISTRIBUTION DEVICE FOR USE WHEN EACH CLOCK SIGNAL COMPRISES A SYNCHONIZATION SIGNAL

Alain Denhez, Velizy-Villacoublay; Francis Hargoaa, Paris, and Jean Aubrée, Bougival, all of France, assignors to Alcatel, Paris, France

Filed Feb. 6, 1986, Ser. No. 826,705
Claims priority, application France, Feb. 7, 1985, 85 01721
Int. Cl.[4] H04L 7/00; H04J 3/06
U.S. Cl. 375—107 9 Claims



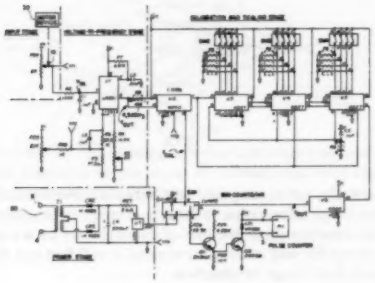
1. Triplicated clock distribution device for use when each clock signal comprises a synchronization signal, the device comprising at least one mother clock, three slave clocks and receivers each having a majority logic circuit connected to the three slave clocks each of which has an oscillator driven by the mother clock, in which device each slave clock comprises a clock generator and a synchronization generator, the clock generator comprises, in addition to the oscillator, a frequency doubler, a frequency divider connected to the frequency doubler and adapted to divide by two the frequency of the signal delivered by said frequency doubler, and an initialization circuit having its output connected to the frequency divider, the synchronization generator comprises an input circuit having its input connected to the synchronization generators of the other two slave clocks and receiving therefrom a clock synchronization signal and a first output connected to the initialization circuit of the frequency divider, a counter having an input connected to the frequency doubler and an initialization input connected to a second output of the input circuit, a JK type flip-flop having a clock input connected to a first output of the counter delivering a first signal, and a shift register driven by the frequency doubler and having its input connected to a complemented output of the flip-flop, said shift register has a first output connected by a first wire to the frequency divider and to the initialization circuit of the frequency divider, a second output connected to a reset input of the flip-flop and a third output connected by a second wire to the frequency divider and to the initialization circuit of the frequency divider, said frequency divider functions as a divider by four when it receives a pulse from each of the first and third outputs and delivers via an output inverter a clock signal comprising a synchronization signal, the clock signal has the same frequency as the first signal delivered by the counter and the synchronization signal has one half the frequency and a duration of one period of the clock signal, the counter comprises a second output delivering a second signal the frequency of which is half that of the first signal and connected on the one hand to another input of the input circuit and on the other hand to each input circuit of the other two slave clocks through an inverter, and each inverter delivers a clock synchronization signal.

4,692,933

ELECTRO-MECHANICAL INTEGRATOR

David J. Wroblewski, Willoughby, and John W. Robertson, Jr., Chesterland, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 24, 1986, Ser. No. 843,369
Int. Cl.[4] H03K *21/02, 21/18;* G01R *23/10*
U.S. Cl. 377—29 **8 Claims**



1. An electronic integrator for integrating a linear voltage signal over time, comprising:

input means for applying the linear voltage signal;

voltage-to-frequency conversion means for converting the linear voltage signal to an input frequency signal having a frequency proportional to the linear voltage signal;

a binary counter connected to said converter for counting pulses of the input frequency signal and for generating an operating frequency signal having a relatively low frequency, and a calibrating frequency signal having a relatively high frequency with respect to the operating frequency signal;

binary rate multiplying means connected to said binary counter for receiving the operating frequency and for generating a counting rate signal which has pulses that are at a scaled proportion of the operating frequency signal, said binary rate multiplying means having scaling means for changing the proportion;

a pulse counter for counting pulses of the counting rate signal and for counting pulses of the calibrating frequency signal; and

switch means having a first input connected to said binary counter for receiving the calibrating frequency signal, a second input connected to said binary rate multiplying means for receiving the counting rate signal, and an output connected to said pulse counter, said switch means being selectively switchable between a calibration position connecting said first input to said pulse counter for incrementing the pulse counter rapidly, and an operating position connecting said second input to said pulse counter for incrementing said pulse counter more slowly and at a rate proportional to the linear voltage signal.

4,692,934

X-RAY LITHOGRAPHY SYSTEM

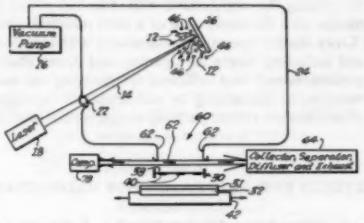
James M. Forsyth, Pittsford, N.Y., assignor to Hampshire Instruments, Rochester, N.Y.

Filed Nov. 8, 1984, Ser. No. 669,442
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—34 **15 Claims**

1. An X-ray lithography system comprising: a laser beam source for generating a laser beam;

a target of a given material upon which said laser beam is focused, said laser beam being of sufficient intensity to create a plasma from said given material, there being soft X-rays and debris emitted from said plasma along a given path;

an X-ray mask positioned to pass a pattern of X-rays to an object; and



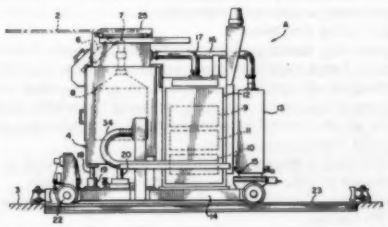
means to generate sheet of an X-ray transparent gas across said path between said mask and said target to displace said debris away from said mask, said sheet having a thickness selected to displace the most energetic debris emitted from said plasma.

4,692,935

AUTOMATIC STEEL ANALYSIS APPARATUS

Koichi Kumakura; Akira Ryuzono, and Yoshinori Hosokawa, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Nov. 27, 1985, Ser. No. 803,214
Claims priority, application Japan, Nov. 28, 1984, 59-252596
Int. Cl.[4] G01N *23/223*
U.S. Cl. 378—49 **4 Claims**



1. An automatic steel analysis apparatus for analyzing the composition of steel materials moving along a conveying path in a harsh environment by carrying out an element analysis using an X-ray excited energy dispersion type fluorescent analysis along the conveying path of the steel materials, comprising:

a movable housing mounted on said apparatus below the conveying path and having a window in the top thereof and an X-ray permeable membrane filling said window, said movable housing being mounted for vertical up and down movement toward and away from the conveying path;

a detector means consisting of an X-ray tube and a semiconductor detection element housed in said movable housing;

a computing apparatus to which said detection element is connected for supplying analysis information thereto for enabling said computing apparatus to determine the composition of steel materials;

an air conditioning apparatus connected to said movable housing for controlling the temperature and humidity within said movable housing;

a leaded rubber packing means mounted around the outside of said window for engaging with the under side of the steel material located in the conveying path when said housing is raised;

an openable and closable protective shutter mounted on said housing and movable between a position in which it covers said window to protect said X-ray permeable membrane and a position away from said window and in said window is uncovered;

a sensor connected with said leaded rubber packing means for sensing the engagement of said leaded rubber packing means with the under side of a steel material; and

an X-ray shutter operatively associated with said X-ray tube and including means for opening said X-ray shutter for a predetermined time sufficient for carrying out analysis in response to the sensing by said sensor of the engagement of said leaded rubber packing means with a steel material.

4,692,936

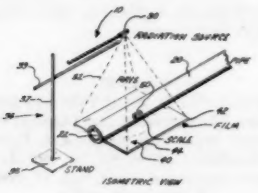
METHOD AND APPARATUS FOR RADIOGRAPHIC INSPECTION

James K. Billeaudeaux, 100 Bon Wier La., Lafayette, La. 70506

Filed Jun. 4, 1984, Ser. No. 617,126

Int. Cl.[4] G01B *15/06*; H05G *1/28*

U.S. Cl. 378—59 **10 Claims**



1. A method for radiographically inspecting the wall thickness of a section of pipe comprising the step of:

a. providing a source of radiation;

b. providing film means;

c. providing means positioned adjacent the wall of the section of pipe to be inspected, the means further including a plurality of equally spaced cuts of known equal width along at least one edge, each cut being of a width equal to the width of metal between each cut, and defining a graduated measurement scale;

d. directing a stream of radiation through the wall of the section of pipe and the scale onto the film means;

e. calipering the thickness of the pipe wall appearing on the film means;

f. comparing the calipered wall thickness against the number of graduations measured along the scale image recorded on the film means for determining the actual thickness of the pipe wall.

4,692,937

RADIOGRAPHY APPARATUS AND METHOD

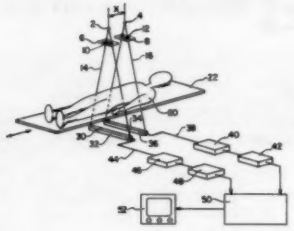
Donald Sashin, Pittsburgh, Pa., and Ernest J. Sternglass, Bloomington, Ind., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed May 2, 1984, Ser. No. 606,057

Int. Cl.[4] A61B *6/00*; G03B *42/02*; H05G *1/60*

U.S. Cl. 378—062 **22 Claims**

1. A method of radiographic imaging of an object having a beating heart comprising establishing a first planar fan beam of penetrating radation and a second planar fan beam of penetrating radiation substantially parallel to said first beam, said first beam and said second beam both impinging on said object and being spaced apart along a given line substantially perpendicular to the planes of the beams, establishing relative movement between said object and both of said first and second beams in a direction substantially parallel to said given line and at a speed such the time interval between the two beams poassing through the identical section of the object is substantially less than the time period for said beating heart, converting the portion of said first beam which passes through said object into a first electrical signal, converting the portion of said second beam which passes through said object into a second electrical signal, processing said first and second electrical signals to obtain first image information and second image information



respectively, subtracting said first image information from said second image information to form final image information such that information about portions of the object which are stationary, except for said relative movement, is nullified and displaying said final image information.

4,692,938

X-RAY SHADOW GRAPH DEVICE

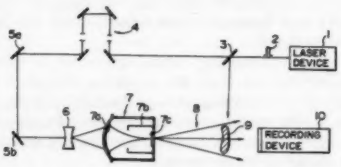
Koichiro Oba, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 4, 1985, Ser. No. 805,426

Claims priority, application Japan, Dec. 11, 1984, 59-261439

Int. Cl.[4] G01N *23/04*

U.S. Cl. 378—62 **5 Claims**



1. An X-ray shadow graph device for observing dynamic changes in a sample comprising

a light source for generating a light pulse having a time duration of approximately 1 ps.;

an X-ray tube including a photocathode and an X-ray target, said X-ray target generating an X-ray pulse in response to electrons emitted by said photocathode impinging thereon;

means coupling said light source to the photocathode of said X-ray tube, said photocathode emitting said electrons when said light pulse impinges thereon;

an image recording device positioned for receiving and recording an X-ray transmission image of said sample; and

means for exciting said sample in synchronism with said light pulse.

4,692,939

SWITCH TESTING

Donald F. Parsons, West Chester, Pa., assignor to Communications Test Design, Inc., West Chester, Pa.

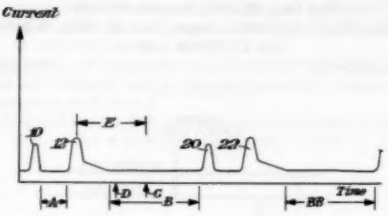
Filed Mar. 19, 1986, Ser. No. 841,173

Int. Cl.[4] H04M *3/28*

U.S. Cl. 379—16 **9 Claims**

1. In the testing of a telephone switching grid having a matrix of individual switches by applying path-establishing pulses that successively close the individual switches to estab-

lish talk paths and determining whether the electrical resistance of the talk paths is within tolerance, the improvement according to which the switches are subsequently checked for



response time by determining whether the electrical resistance is within tolerance before about 50 milliseconds have elapsed after the path-establishing pulse.

4,692,940

TELEPHONE HOOK SWITCH

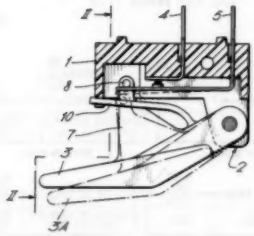
Peter J. Baines, Colchester, England, assignor to Standard Telephones and Cables Public Limited Company, London, England

Filed Mar. 14, 1985, Ser. No. 711,821

Claims priority, application United Kingdom, Mar. 17, 1984, 8407019

Int. Cl.[4] H04M *1/08*

U.S. Cl. 379—424 **2 Claims**



1. A telephone hook-switch arrangement, which includes a base assembly on which the hook-switch contacts are mounted, a hook-switch lever which is substantially T-shaped in side view, support means for the hook-switch lever on the base assembly, with one-end of the cross-piece of the T of said lever pivotally mounted on said support means, and a hook-switch member on the base assembly which in the on-hook condition is held non-operated by handset against the urgence of spring means, wherein when the telephone which includes the arrangement is in the on-hook condition the handset member depresses the other end of the cross-piece of the T, wherein a pin on the leg of the T is adjacent to one of the hook-switch contacts, wherein there is a spring strip integral with the cross-piece, wherein said spring strip extends across the leg of the T and engages a fixed portion of the base assembly, and wherein when the handset is off-hooked the lever rotates about its pivot against the urgence of the spring means to close the hook-switch contacts via said pin, which rotation of the lever occurs under the influence of the spring means associted with the hook-switch member.

4,692,941

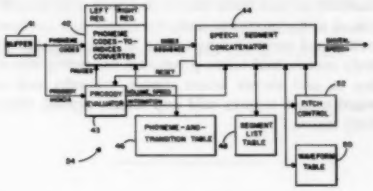
REAL-TIME TEXT-TO-SPEECH CONVERSION SYSTEM

Richard P. Jacks, Manhattan Beach, and Richard P. Sprague, Tustin, both of Calif., assignors to First Byte, Long Beach, Calif.

Filed Apr. 10, 1984, Ser. No. 598,892

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—52 **17 Claims**



1. A machine method of converting electrical signals representing text to audible speech in real time, comprising the steps of:

(a) storing, in the memory of a data processing device, a plurality of digitized waveforms consisting of groups of digitally encoded samples, said waveforms being representative of portions of phonemes and of transitions between phonemes;

(b) analyzing said signals to determine a sequence of phonemes and transitions indicative of the pronunciation of said text;

(c) generating a sequence of codes representing said phonemes and transitions;

(d) using said codes to select groups of said digitized waveforms, each said group representing a phoneme or a transition;

(e) concatenating the waveforms in each of said groups to form a waveform representing the speech sound corresponding to one of said phonemes or transitions;

(f) alternatingly concatenating said phoneme-representing waveform groups and said transition-representing waveform groups to form a composite waveform train representing in digitized form, the spoken equivalent of said text; and

(g) converting said digitized composite waveform into an audible analog signal representative thereof.

4,692,942

ELECTROACOUSTIC TRANSDUCER WITH PIEZOELECTRIC DIAPHRAGM

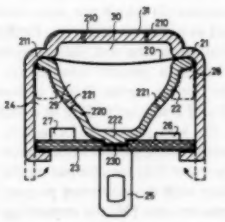
Jean P. Morgand, La Celle sur Loup, France, assignor to Thomson CSF, Paris, France

Filed Oct. 23, 1985, Ser. No. 790,451

Claims priority, application France, Oct. 30, 1984, 84 16594

Int. Cl.[4] H04C *17/02*

U.S. Cl. 381—114 **6 Claims**



1. An electroacoustic transducer assembly comprising:

tubular shaped metal body means having an open end and a closed end, said closed end having a plurality of holes formed therein to admit accoustic pressure, said body means further defining an inwardly extending shoulder portion proximate said closed end;

metal cup means having a small base with a tenon projection extending outwardly therefrom, and a large ring shaped open end;

piezoelectric diaphragm means for mounting between said shoulder of said body means and said ring shaped open end of said cup means; and

circuit board means for mounting in said open end of said body means, said tenon projection extending into a mortice in said circuit board means, whereby said circuit board means secures said cup means against said metal body means.

4,692,943

METHOD OF AND SYSTEM FOR OPTO-ELECTRONIC INSPECTION OF A TWO-DIMENSIONAL PATTERN ON AN OBJECT

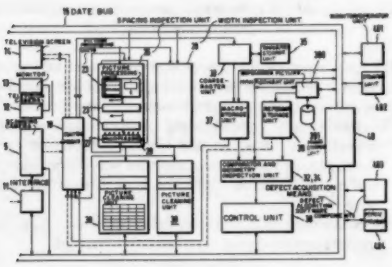
Ludwig Pietzsch, Karlsruhe; Knud Overlach; Detlef Senger, both of Ettlingen, and Walter Breunig, Karlsruhe, all of Fed. Rep. of Germany, assignors to Dr. Ludwig Pietzsch GmbH, Ettlingen, Fed. Rep. of Germany

Filed Dec. 27, 1984, Ser. No. 686,663

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347645

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—8 **9 Claims**



1. A system for opto-electronic inspection of a two-dimensional pattern on an object, especially a printed board, comprising a scanning camera for line-by-line scanning of the object, an X-Y-table for supporting the object, said table permitting relative movement of the object with respect to the scanning camera, and a picture processing apparatus in which picture operations are performed for the purpose of defect detection, characterized in that the picture processing apparatus comprises a micro-inspection unit (**22**) and a macro-inspection unit (**24**) connected in parallel relationship, output signals from the scanning camera (**5**) which are converted into digital signals being supplied as inputs to said units, further characterized in that the macro-inspection unit (**24**) comprises a coarse-raster unit (**33**) in which a picture information "bright" or "dark" characteristic for an entire frame is formed from a plurality of pixels of said frame according to a majority vote, a macro-storage (**37**) for said picture information, a reference storage (**39**) for corresponding picture information of the reference picture, a comparator (**32**) for comparing the characteristic picture information with the reference picture information, and a geometry inspection unit (**34**) for inspecting the obtained picture information on the basis of predetermined geometric criteria.

4,692,944

IMAGE DATA PROCESSING SYSTEM

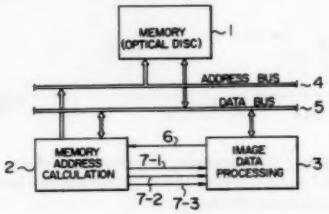
Hidefumi Masuzaki, Odawara, and Etsuo Horikawa, Minamiashigara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,158

Claims priority, application Japan, Dec. 28, 1983, 58-245487

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—41 **19 Claims**



1. An image data processing system, comprising:

an optical disc storage memory for storing image data;

a bit-serial processing type image data processing unit for processing the image data stored in said memory; and

an address calculation unit of the bit-parallel processing type whch operates in parallel with said image data processing unit for calculating the address of the image data in said memory and controlling input/output of said image data to and from said image data processing unit.

4,692,945

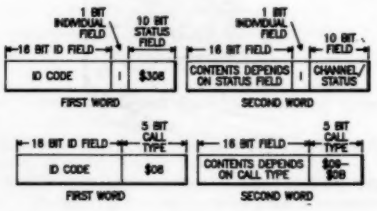
DISPATCH TRUNKED RADIO SYSTEM

Kenneth J. Zdunek, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 687,810, Dec. 31, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 933,367

Int. Cl.[4] H04B *7/14*

U.S. Cl. 455—17 **16 Claims**



15. A method of transmitting and receiving messages between a transmitter and a receiver, comprising the steps of:

in the transmitter:

(a) transmitting a first data packet having at least one dedicated field contained therein, wherein said dedicated field is comprised of coded data that is first data packet information, and wherein said dedicated field can selectively be an indication that an associated second data packet will be transmitted following transmission of said first data packet; and

(b) optionally transmitting a second data packet, wherein said second data packet includes at least one field that comprises coded data that is second data packet information, provided that said second data packet is only transmitted following transmission of a first data packet having said indication that an associated second data packet will be subsequently transmitted; and

in the receiver:

(c) decoding, if received by said receiver, said first data packet to determine its contents, such that:

(1) if said first data packet does not include said indication that an associated second data packet will be transmitted, said receiver accepts information contained in said first data packet;

(2) if said first data packet does include said indication that an associated second data packet will be transmitted, said receiver does not yet accept information contained in said first data packet; and

(d) decoding, if transmitted by said transmitter and received by said receiver, said second data packet to determine its contents, such that;

(1) if said second data packet was not preceded by reception, within a predetermined period of time, of a first data packet having an indication that an associated second data packet would be subsequently transmitted, said receiver will not accept information contained in said second data packet; and

(2) if said second data packet was preceded by reception, within a predetermined period of time, of a first data packet having an indication that an associated second data packet would be subsequently transmitted, said receiver will accept information contained in both said second data packet and in said first data packet.

DESIGN PATENTS

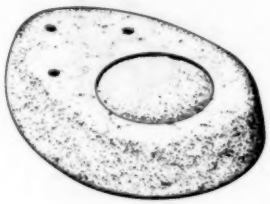
GRANTED SEP. 8, 1987

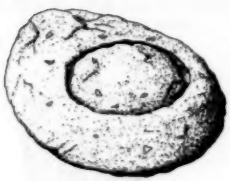
ERRATA

For CLASS	See PATENT NO.
D32-025	291,837

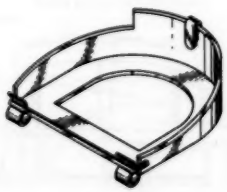
SEPTEMBER 8, 1987

291,740
PET FOOD BISCUIT
Albert Spiel, Yonkers, N.Y.; James Roe, Wayne, and Henry C. Spanier, West Milford, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.
Filed Oct. 12, 1984, Ser. No. 659,902
Term of patent 14 years
U.S. Cl. D1—106

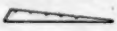




291,741
PROTECTIVE SHIELD FOR SHOE HEELS
Ulysses C. Beaty, 1825 E. 1st St., Lubbock, Tex. 79403
Filed May 3, 1985, Ser. No. 729,935
Term of patent 14 years
U.S. Cl. D2—277

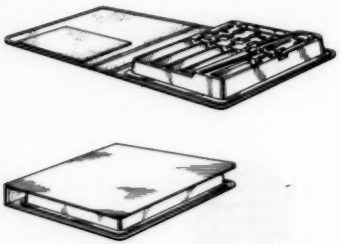


291,742
SHOE HEEL INSERT
VlJay Surpuriya, Memphis, Tenn., and Charles J. Gudas, Hinsdale, Ill., assignors to Scholl, Inc., Memphis, Tenn.
Filed Jun. 22, 1984, Ser. No. 623,758
Term of patent 14 years
U.S. Cl. D2—314

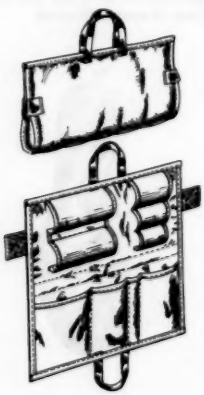


291,743
SHOE SOLE
Masanobu Inohara, and Yoshiaki Hase, both of Akashi, Japan, assignors to Asics Corporation, Japan
Filed Apr. 17, 1985, Ser. No. 724,609
Claims priority, application Japan, Jan. 19, 1985, 60-1436
Term of patent 14 years
U.S. Cl. D2—320

291,744
COMPUTER MAINTENANCE TOOL CARRYING CASE
Robert M. Cohen, Rockville, Md., assignor to Micro Connection, Inc., Marlow, N.H.
Filed Oct. 22, 1984, Ser. No. 663,449
Term of patent 14 years
U.S. Cl. D3—74

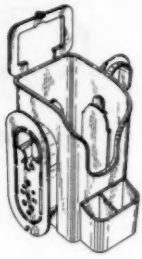


291,745
MEDICAL IMPLEMENT CASE
Ole Q. Hansen, Seminole, Fla., assignor to Buffalo Medical Specialties, Mfg., Inc., St. Petersburg, Fla.
Filed Mar. 4, 1985, Ser. No. 707,751
Term of patent 14 years
U.S. Cl. D3—30.1

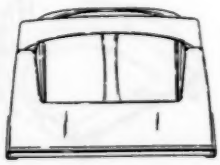


291,746
COMBINED HOLDER FOR POLICE NIGHTSTICK AND FLASHLIGHT
Alan C. Evans, 10333 Leverman Rd., Aumsville, Oreg. 97325
Filed Jun. 29, 1984, Ser. No. 626,198
Term of patent 14 years
U.S. Cl. D3—105

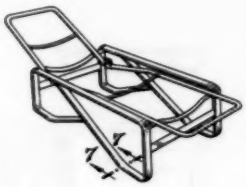
291,747
STORAGE AND CARRYING CONTAINER FOR AN ELECTRIC DRILL AND ACCESSORIES
John M. Bunge, 5 Melton Court, London, SW7, England
Filed Jan. 7, 1985, Ser. No. 689,398
Term of patent 14 years
U.S. Cl. D3—30.1



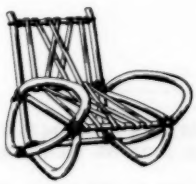
291,748
BABY CHAIR
Kjell Henriksson, Bredaryd, Sweden, assignor to Baby Bjorn Aktiebolag, Bredaryd, Sweden
Filed Nov. 7, 1984, Ser. No. 668,931
Claims priority, application Sweden, May 10, 1984, 84-1490
Term of patent 14 years
U.S. Cl. D6—333



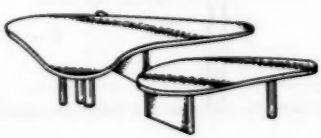
291,749
FRAME FOR AN ADJUSTABLE CHAISE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,240
Term of patent 14 years
U.S. Cl. D6—361



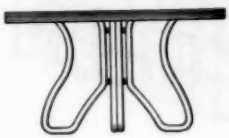
291,750
ARM CHAIR OR SIMILAR ARTICLE
Terrance A. Baroody, Orange Park, and Jerry R. Bass, Green Cove Springs, both of Fla., assignors to Baroody Spence Furniture Industries, Inc., Jacksonville, Fla.
Filed May 30, 1984, Ser. No. 615,372
Term of patent 14 years
U.S. Cl. D6—369



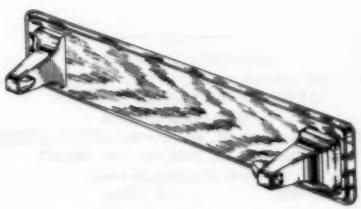
291,751
TABLE
Maurizio Salvato, Gallarate, Italy, assignor to Saporiti Italia S.p.A., Italy
Filed Mar. 15, 1985, Ser. No. 712,363
Claims priority, application Italy, Sep. 18, 1984, 23174/84[U]
Term of patent 14 years
U.S. Cl. D6—482

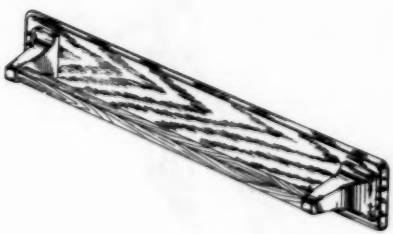


291,752
TABLE OR THE LIKE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,237
Term of patent 14 years
U.S. Cl. D6—487

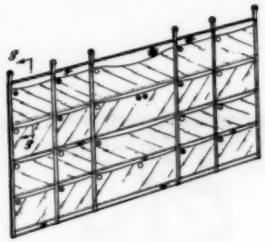


291,753
TOWEL HOLDER
Daniel L. Pool, Paradise Valley, Ariz., assignor to Designer Bathware, Inc., Phoenix, Ariz.
Division of Ser. No. 514,002, Jul. 15, 1983, Pat. No. Des. 283,188. This application Mar. 24, 1986, Ser. No. 845,772
Term of patent 14 years
U.S. Cl. D6—522





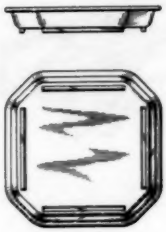
291,754
COMBINED BOOK AND MAGAZINE DISPLAY
Judith Griswold, 1101 Southside Dr., Elko, Nev. 89801
Filed Jul. 26, 1985, Ser. No. 759,292
Term of patent 14 years
U.S. Cl. D6—553



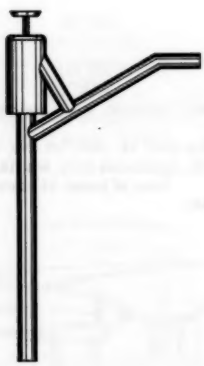
291,755
SPICE RACK
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Aug. 16, 1985, Ser. No. 766,182
Term of patent 14 years
U.S. Cl. D6—566

291,756
BAG ORGANIZER
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Aug. 16, 1985, Ser. No. 766,183
Term of patent 14 years
U.S. Cl. D6—566

291,757
PLATE
Joost R. Ritman, Bloemgracht 15-19, 1016 KB Amsterdam, Netherlands
Filed Nov. 23, 1984, Ser. No. 674,265
Term of patent 14 years
U.S. Cl. D7—1



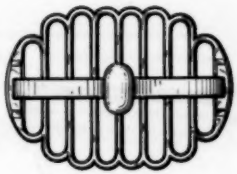
291,758
MANUALLY OPERABLE STRAW
William H. Albury, II, 130 NE. 8th Ave., Boynton Beach, Fla. 33435
Filed Nov. 14, 1985, Ser. No. 804,986
Term of patent 14 years
U.S. Cl. D7—42

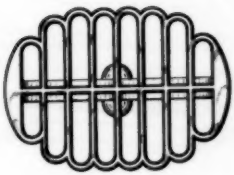


291,759
CONDIMENT SHAKER OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Feb. 22, 1985, Ser. No. 704,562
Term of patent 14 years
U.S. Cl. D7—54

291,760
ROLLING PIN
James C. Fallgatter, and Tarla A. Fallgatter, both of 2045 Sea Cove La., Costa Mesa, Calif. 92627
Filed Nov. 16, 1984, Ser. No. 672,416
Term of patent 14 years
U.S. Cl. D7—99

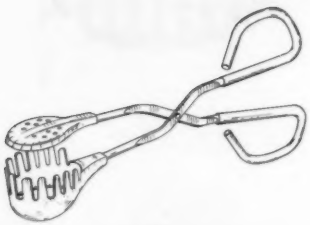
291,761
MASHER
George Hoehne, Glen Cove, N.Y., assignor to Bonny Products, Inc., Lynbrook, N.Y.
Filed Jan. 22, 1985, Ser. No. 692,988
Term of patent 14 years
U.S. Cl. D7—101



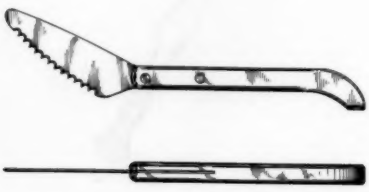


291,762
MEAT TENDERIZER
Raymond D. Collins, Sr., 810 Curtiss, Schertz, Tex. 78154
Filed Feb. 11, 1985, Ser. No. 700,110
Term of patent 14 years
U.S. Cl. D7—101

291,763
COMBINATION PASTA AND VEGETABLE TONGS
James R. Dunn, Fairfield, Conn., and Lee R. Chasen, Port Chester, N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Feb. 21, 1985, Ser. No. 703,937
Term of patent 14 years
U.S. Cl. D7—105

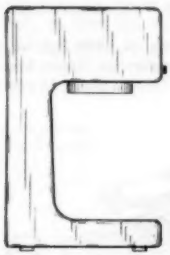


291,764
STEAK KNIFE
Irving L. Mark, Highland Park, Ill., assignor to Tip Top Corporation, Omaha, Nebr.
Filed Jan. 24, 1985, Ser. No. 694,264
Term of patent 14 years
U.S. Cl. D7—151

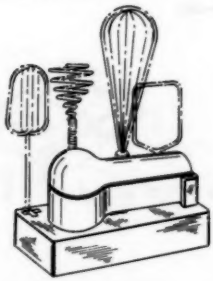


291,765
COFFEE MAKER
Kazuo Takada, Nara; Teruaki Egashira; Yoichi Ikegami, both of Osaka; Kazuhiro Konishi, and Tadao Suzuki, both of Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Jan. 18, 1985, Ser. No. 692,899
Claims priority, application Japan, Jul. 19, 1984, 59-30131
Term of patent 14 years
U.S. Cl. D7—309

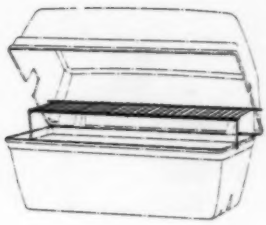
291,766
COFFEEMAKER
Norman A. Steinkamp, La Grange Park, and Dennis N. Burmeister, Libertyville, both of Ill., assignors to Sunbeam Corporation, Downers Grove, Ill.
Filed Mar. 22, 1985, Ser. No. 715,212
Term of patent 14 years
U.S. Cl. D7—309

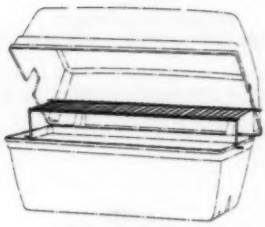


291,767
COMBINED KITCHEN APPLIANCE AND BASE ASSEMBLY
Robert Osit, Shelton, Conn., assignor to Black & Decker, Inc., Newark, Del.
Continuation of Ser. No. 651,927, Sep. 19, 1984, which is a continuation of Ser. No. 652,059, Sep. 19, 1984. This application Jun. 4, 1986, Ser. No. 870,735
Term of patent 14 years
U.S. Cl. D7—379



291,768
WARMING RACK
Armand Murphy, Columbus, Ga., assignor to W. C. Bradley Enterprises, Inc., Columbus, Ga.
Filed Nov. 30, 1984, Ser. No. 676,940
Term of patent 14 years
U.S. Cl. D7—408

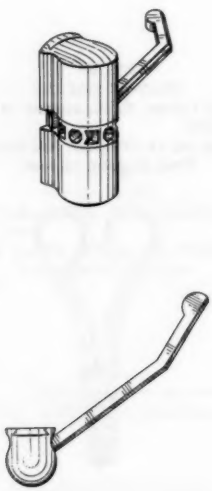




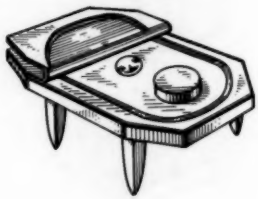
291,769
FLOWER SHEARS
Harland Lemcke, Corona, Calif., assignor to Corona Clipper Co., Corona, Calif.
Filed Jul. 11, 1985, Ser. No. 753,954
Term of patent 14 years
U.S. Cl. D8—4

291,770
ANVIL FOR A STAPLER
Masaho Takami, Hirakata, Japan, assignor to Shoko Kiko Co., Ltd., Shijo Nawate, Japan
Filed May 30, 1984, Ser. No. 615,245
Term of patent 14 years
U.S. Cl. D8—50

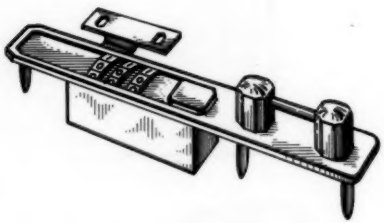
291,771
DOOR CLOSER
Fred Vandergeest, 131 Finchdene Square, Units 1 & 2, Scarborough, Ontario, Canada M1X 1A6
Filed Nov. 21, 1985, Ser. No. 806,023
Term of patent 14 years
U.S. Cl. D8—330



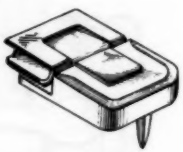
291,772
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Jun. 14, 1984, Ser. No. 620,423
Claims priority, application Hague, Dec. 15, 1983, 73673
The portion of the term of this patent subsequent to Oct. 30, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—331



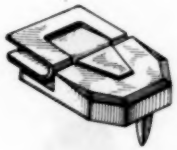
291,773
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Aug. 14, 1984, Ser. No. 640,520
Claims priority, application Hague, Mar. 30, 1984, 73939
Term of patent 14 years
U.S. Cl. D8—331



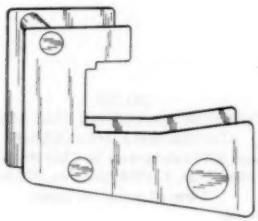
291,774
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Oct. 12, 1984, Ser. No. 660,064
The portion of the term of this patent subsequent to Sep. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—341



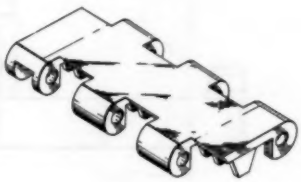
291,775
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Oct. 12, 1984, Ser. No. 660,095
The portion of the term of this patent subsequent to Sep. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—341



291,776
CABLE CONNECTING PULL FOR AN AUTOMATIC DEAD END AND A TENSIONING DEVICE
Dale E. Miller, 27500 Idaho St., Bonita Springs, Fla. 33923
Filed Nov. 19, 1984, Ser. No. 673,148
Term of patent 14 years
U.S. Cl. D8—382



291,777
CONVEYOR BELT MODULE
James M. Lapeyre, New Orleans, and William G. Faulkner, Marrero, both of La., assignors to The Laitram Corporation, New Orleans, La.
Filed Nov. 15, 1985, Ser. No. 805,240
Term of patent 14 years
U.S. Cl. D8—499



291,778
BOTTLE, OR SIMILAR ARTICLE
Karen A. Rosenwinkel, Oak Park, Ill., assignor to W. Braun Company, Chicago, Ill.
Division of Ser. No. 598,228, Apr. 9, 1984, Pat. No. Des. 287,823. This application Jun. 9, 1986, Ser. No. 872,463
Term of patent 14 years
U.S. Cl. D9—413

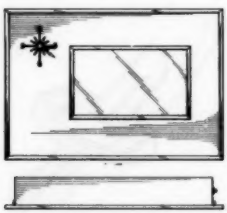
291,779
CAP FOR PACKAGES
Koichi Inaba, 1994 Denpo Takishita, Fuji-shi, Shizuoka-ken, Japan
Filed Dec. 13, 1984, Ser. No. 681,330
Claims priority, application Japan, Jun. 22, 1984, 59-25866
Term of patent 14 years
U.S. Cl. D9—445

291,780
DISPENSING NOZZLE FOR CONTAINER
Fred E. Guttormson, Minnetonka, Minn., assignor to C. R. Mfg. Co., Mound, Minn.
Filed Mar. 29, 1985, Ser. No. 717,894
Term of patent 14 years
U.S. Cl. D9—447

291,781
COMBINED OIL SPOUT AND VALVE
Loren A. Jacobson, 14825 Camero La., Rosemount, Minn. 55068
Filed Nov. 19, 1984, Ser. No. 672,459
Term of patent 14 years
U.S. Cl. D9—448

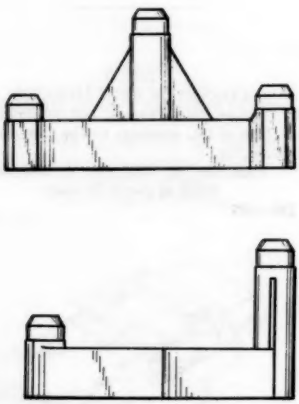
291,782
AEROSOL CAN OVERCAP
William J. O'Neil, Jr., Cincinnati, Ohio; Daniel J. Sims, Belleville, Mich., and Randy Embertson, Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Feb. 22, 1985, Ser. No. 704,126
Term of patent 14 years
U.S. Cl. D9—448

291,783
COMBINED CLOCK AND AQUARIUM OR THE LIKE
Walter Baumer, 1120 Nightingale Ave., Miami Springs, Fla. 33166
Filed Dec. 23, 1985, Ser. No. 812,370
Term of patent 14 years
U.S. Cl. D10—2

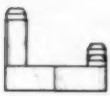


291,784
COMBINED WATCH AND BRACELET
Gianni Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 17, 1985, Ser. No. 724,312
Claims priority, application Italy, Oct. 25, 1984, 36175/84[U]
Term of patent 14 years
U.S. Cl. D10—32

291,785
ADAPTOR FOR ADJUSTING THE AIM OF AN AUTOMOBILE HEADLIGHT
Selim R. Rahme, 33514 Jefferson, St. Clair Shores, Mich. 48082
Filed Mar. 1, 1985, Ser. No. 707,402
Term of patent 14 years
U.S. Cl. D10—46

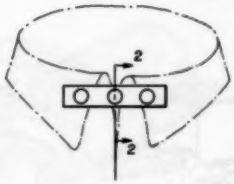


291,786
ADAPTOR FOR ADJUSTING THE AIM OF AN AUTOMOBILE HEADLIGHT
Selim R. Rahme, 33514 Jefferson, St. Clair Shores, Mich. 48082
Filed Mar. 1, 1985, Ser. No. 707,403
Term of patent 14 years
U.S. Cl. D10—46

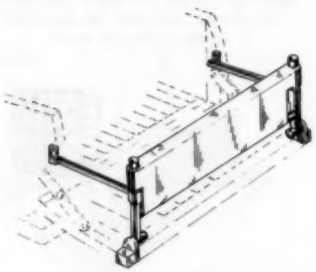


291,787
JOYSTICK CONTINUITY TESTER
Robert L. Sheldon, 8659 University Point Cir. NE., Bremerton, Wash. 98310
Filed May 17, 1985, Ser. No. 735,826
Term of patent 14 years
U.S. Cl. D10—78

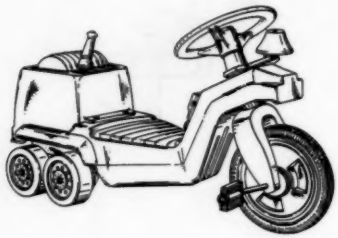
291,788
COLLAR ORNAMENT
Earl R. Caulkins, P.O. Box 1173, Fallon, Nev. 89406
Filed Oct. 25, 1984, Ser. No. 664,750
Term of patent 14 years
U.S. Cl. D11—213



291,789
TRUCK BED EXTENSION
Robert A. Noga, 13404 Calais Dr., Del Mar, Calif. 92014
Filed Oct. 24, 1984, Ser. No. 664,077
Term of patent 14 years
U.S. Cl. D12—98

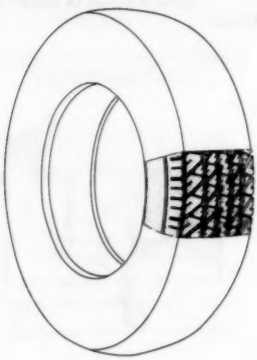


291,790
CHILDREN'S RIDE-ON SIMULATED DUMP TRUCK
Michael J. Clarke, Plantsville; Paul S. Santarsiero, Avon, and John P. Kearsey, West Suffield, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.
Filed Feb. 11, 1985, Ser. No. 700,457
Term of patent 14 years
U.S. Cl. D12—108

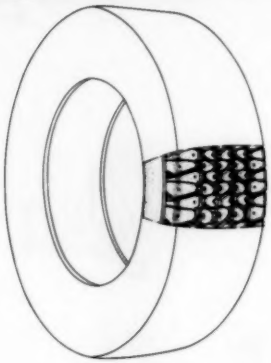


291,791
FOLDING WALKER
Lewis Bean, R.F.D. 8, #302, Claremore, Okla. 74017
Filed Jan. 25, 1985, Ser. No. 694,837
Term of patent 14 years
U.S. Cl. D12—130

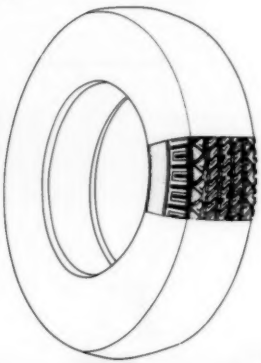
291,792
TIRE
Kevin F. Clemens, Simpsonville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Feb. 28, 1985, Ser. No. 706,521
Term of patent 14 years
U.S. Cl. D12—147



291,793
TIRE
Kevin F. Clemens, Simpsonville, S.C., assignor to Michelin et Recherche et Technique, Switzerland
Filed Feb. 28, 1985, Ser. No. 706,744
Term of patent 14 years
U.S. Cl. D12—147



291,794
TIRE
Kevin F. Clemens, Simpsonville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Feb. 28, 1985, Ser. No. 706,745
Term of patent 14 years
U.S. Cl. D12—147

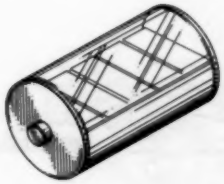


291,795
RADIATOR GRILLE
Ryoichi Sasaoka, Yokosuka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 30, 1985, Ser. No. 739,457
Term of patent 14 years
U.S. Cl. D12—163

291,796
VEHICLE WHEEL CENTER
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Aug. 26, 1985, Ser. No. 769,514
Term of patent 14 years
U.S. Cl. D12—209

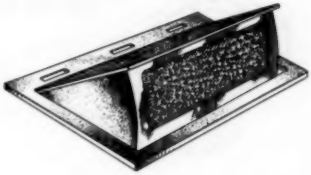
291,797
ELECTRIC MOTOR HOUSING
Wolfgang Spiegelstein, Glendale, Calif., assignor to Kennedy Company, Monrovia, Calif.
Filed Dec. 18, 1984, Ser. No. 683,301
Term of patent 14 years
U.S. Cl. D13—1

291,798
SOLAR BATTERY
Raymond F. Curiel, P.O. Box 30355, Phoenix, Ariz. 85046
Filed Oct. 18, 1984, Ser. No. 662,362
Term of patent 14 years
U.S. Cl. D13—8



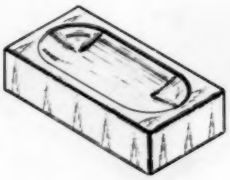
291,799
VIDEOCASSETTE
Anne L. Marshall, Elmhurst, and Michael S. Joss, Chicago, both of Ill., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Mich.
Filed Apr. 26, 1985, Ser. No. 727,559
Term of patent 14 years
U.S. Cl. D14—11

291,800
RETRACTABLE SPEAKER ENCLOSURE
Allen M. Morris, Rte. 9 Box 184, Benton, Ky. 42025
Filed Apr. 19, 1985, Ser. No. 725,310
Term of patent 14 years
U.S. Cl. D14—33

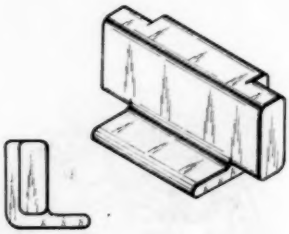


291,801
COMBINATION HANDSET AND STAND CELLULAR TELEPHONE UNIT
Takeshi Suzuki, and Mamoru Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Feb. 8, 1985, Ser. No. 699,978
Claims priority, application Japan, Aug. 8, 1984, 59-33631
Term of patent 14 years
U.S. Cl. D14—53

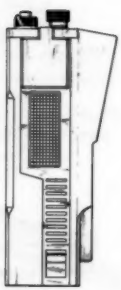
291,802
IMPLEMENT FOR ACTIVATING AND DEACTIVATING A TELEPHONE HOOK SWITCH
Robert D. Mantell, 3135 N. Ellington Dr., Los Angeles, Calif. 90068
Filed Jul. 18, 1985, Ser. No. 756,241
Term of patent 14 years
U.S. Cl. D14—59



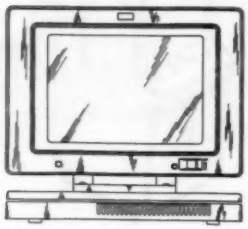
291,803
IMPLEMENT FOR ACTIVATING AND DEACTIVATING A TELEPHONE HOOK SWITCH
Robert D. Mantell, 3135 N. Wellington Dr., Los Angeles, Calif. 90068
Filed Jul. 18, 1985, Ser. No. 756,242
Term of patent 14 years
U.S. Cl. D14—59



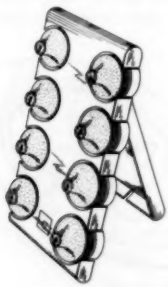
291,804
PORTABLE RADIO TELEPHONE AND FM TWO-WAY RADIO
David L. George, Indianapolis, Ind., assignor to Uniden Corporation, Indianapolis, Ind.
Filed Jan. 27, 1986, Ser. No. 822,469
Term of patent 14 years
U.S. Cl. D14—64



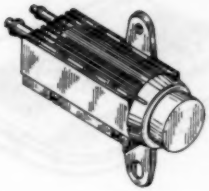
291,805
ADJUSTABLE DISPLAY TERMINAL
Michael H. Sharp, Palmhall Close, England, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 27, 1984, Ser. No. 675,928
Claims priority, application United Kingdom, May 30, 1984, 1019970
Term of patent 14 years
U.S. Cl. D14—113



291,806
MULTIPLE CONTROL ELEMENT UNIT FOR DATA PROCESSING APPARATUS
Ronald I. Conway, Port Ewen; Samuel A. Lucente, Glenford, and David L. Schaum, Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 24, 1984, Ser. No. 664,125
Term of patent 14 years
U.S. Cl. D14—114



291,807
ELECTRIC VACUUM REGULATOR VALVE FOR USE WITH AUTOMOTIVE EMISSIONS CONTROL
Kwang Yew, and Hugh S. Carrothers, both of Chatham, Canada, assignors to Canadian Fram Limited, Chatham, Canada
Filed Aug. 30, 1984, Ser. No. 646,347
Term of patent 14 years
U.S. Cl. D15—5

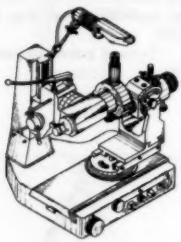


291,808
SUNGLASSES
Bernhard Meyerspeer, Zell am See, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Oct. 9, 1984, Ser. No. 659,190
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 11AR1618/84
Term of patent 14 years
U.S. Cl. D16—102

291,809
GUITAR PICK
Robert S. Jasper, 16581 Buena Vista, Orange, Calif. 92665
Filed Nov. 1, 1985, Ser. No. 793,920
Term of patent 14 years
U.S. Cl. D17—20

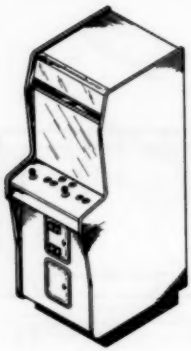
291,810
TYPING UNIT
Vid Bratasevec, Koper, Yugoslavia, assignor to Iskra-Delta, Proizvodnja Racunalniskih Sistemov in Inzeniring, P.O., Ljubljana, Yugoslavia
Filed Nov. 5, 1985, Ser. No. 795,110
Claims priority, application Yugoslavia, May 6, 1985, 210/85
Term of patent 14 years
U.S. Cl. D18—12

291,811
ENGRAVER FOR FINGER RING AND BRACELET
Yen-Shen Jen, No. 64, Alley 75, Yu-Pin Lane, Sec. 3, Du-Hsin Road, Pan Chiao City, Taipei Hsien, Taiwan
Filed Aug. 9, 1985, Ser. No. 764,178
Term of patent 14 years
U.S. Cl. D18—13



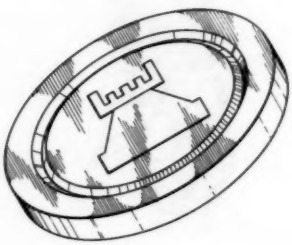
291,812
VARIABLE DATA IMPRINTER
Eric G. Gingras, Reston, Va., assignor to Security Imprinter Corporation, Walkersville, Md.
Filed May 7, 1985, Ser. No. 731,575
Term of patent 14 years
U.S. Cl. D18—14

291,813
VIDEO GAME CABINET
Lance N. Barr, Redmond, Wash., assignor to Nintendo of America Inc., Redmond, Wash.
Filed May 9, 1985, Ser. No. 732,505
Term of patent 14 years
U.S. Cl. D21—13



291,814
APERTURED SPINNER FOR A GAME BOARD
Abele Cafaro, Jr., 51 Lockwood Ave., Howell, N.J. 07731
Filed Mar. 14, 1985, Ser. No. 711,619
Term of patent 14 years
U.S. Cl. D21—22

291,815
POP TOP CHESS GAME PIECE
Michael Harris, Rte. 1, Hennessey, Okla. 73742
Filed Aug. 16, 1984, Ser. No. 641,504
Term of patent 14 years
U.S. Cl. D21—52

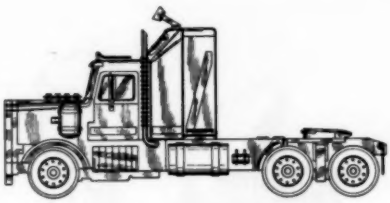


291,816

TOY TRUCK

Howard N. Bollinger; Mark D. Boudreaux; Robert E. Cordrey; Charles E. Ligon; David A. Myers; Walter E. Stroud, all of Cincinnati, Ohio; Earl M. Wood, Jr., Newport, Ky., and Jan Van de Merwe, III, Cincinnati, Ohio, assignors to Kenner Parker Toys Inc., Beverly, Mass.

Filed Feb. 14, 1985, Ser. No. 701,581
Term of patent 14 years
U.S. Cl. D21—134



291,817

FINGER PUPPET OR SIMILAR ARTICLE

A. Edward Fogarty; Bonnie R. Fogarty, both of Sarasota, Fla., and Sabrina M. Danna, West Warick, R.I., assignors to Hasbro-Bradley, Pawtucket, R.I.

Filed Apr. 29, 1985, Ser. No. 728,603
Term of patent 14 years
U.S. Cl. D21—153

291,818

TALKING BEAR

Earl K. Forsse, Granada Hills, Calif., assignor to Alchemy II, Inc., Chatsworth, Calif.

Filed Oct. 3, 1984, Ser. No. 657,178
Term of patent 14 years
U.S. Cl. D21—159

291,819

TOY STUFFED FIGURE OR SIMILAR ARTICLE

Thomas P. Schneider, Westlake, and Susan E. Trentel, Lakewood, both of Ohio, assignors to Those Characters From Cleveland, Inc., Cleveland, Ohio

Filed Oct. 7, 1985, Ser. No. 784,957
Term of patent 14 years
U.S. Cl. D21—161

291,820

FRAME FOR BARBELL WEIGHTS OR SIMILAR ARTICLE

Stanley R. Carter, Jr., 1945 Mathew Dr., Layton, Utah 84041

Filed May 22, 1985, Ser. No. 736,958
Term of patent 14 years
U.S. Cl. D21—191

291,821

EXERCISE TREADMILL

Heikki Kiiski, Turku, Finland, assignor to Tunturipyörä OY, Turku, Finland

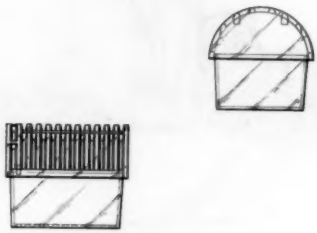
Filed Mar. 12, 1985, Ser. No. 710,666
Claims priority, application Finland, Dec. 13, 1984, 1182/84
Term of patent 14 years
U.S. Cl. D21—192

291,822
EXERCISE BICYCLE
King Liu, No. 19, Shun Fan Road, Ta Chia Chen, Taichung Hsien, Taiwan
Filed Jun. 3, 1985, Ser. No. 740,222
Term of patent 14 years
U.S. Cl. D21—194

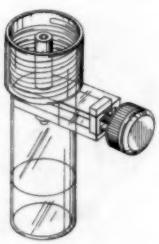
291,823
EXERCISE ROWING MACHINE
David B. Smith, Mercer Island, and Randolph F. Miller, Mt. Vernon, both of Wash., assignors to Precor Incorporated, Redmond, Wash.
Filed Sep. 16, 1985, Ser. No. 775,182
Term of patent 14 years
U.S. Cl. D21—195

291,824
FAUCET KNOB
Bethany Lathrop, Los Angeles, Calif., assignor to Aloys F. Dornbracht GmbH & Co., Iserlohn, Fed. Rep. of Germany
Filed Oct. 18, 1985, Ser. No. 789,059
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, MR 7435
Term of patent 14 years
U.S. Cl. D23—28

291,825
AQUARIUM FILTER CARTRIDGE
Jerome Goldman, New York; Marvin Goldman, Great Neck, and Gerald Phillips, Glen Cove, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.
Filed Dec. 21, 1984, Ser. No. 685,140
Term of patent 14 years
U.S. Cl. D23—4



291,826
FLOW CONTROLLER VALVE
Mitchell E. Maddock, 541 W. Coolidge Ave., Coolidge, Ariz. 85228
Filed Jul. 16, 1984, Ser. No. 631,247
Term of patent 14 years
U.S. Cl. D23—19

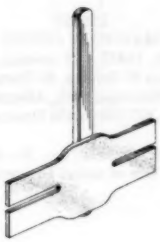


291,827
SURGICAL LAPAROTOMY PAD
Thomas Denny, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Dec. 19, 1983, Ser. No. 562,683
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—34

291,828
VIAL ENCLOSURE
Mark E. Larkin, Lindenhurst; Edward S. Tripp, Park City, and Richard A. Johnson, Winthrop Harbor, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 7, 1985, Ser. No. 699,518
Term of patent 14 years
U.S. Cl. D24—56

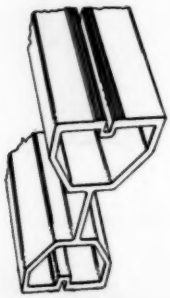
291,829
NEBULIZER
Albert H. Torongo, Yardley, Pa., and Thomas B. Aldrich, III, Spring Valley, N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Mar. 21, 1985, Ser. No. 714,527
Term of patent 14 years
U.S. Cl. D24—62

291,830
FINGER SPLINT
John F. Murtaugh, III, 3060 Tecumseh Ct., Tucson, Ariz. 85715; Carol A. Rae, 6720 N. Camino Padre Isidoro, Tucson, Ariz. 85718, and Arnold J. Arem, 460 S. Colonia Ave., Tucson, Ariz. 85711
Filed Mar. 22, 1985, Ser. No. 714,833
Term of patent 14 years
U.S. Cl. D24—64

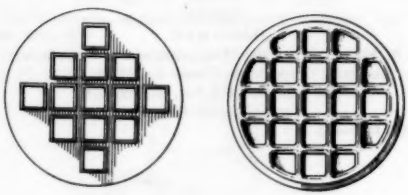


291,831
HAND RAIL
John B. Noyce, Grosse Ile, Mich., assignor to Manufacturer's Merchandising Corporation, Grosse Ile, Mich.
Filed Sep. 21, 1984, Ser. No. 652,674
Term of patent 14 years
U.S. Cl. D25—73

291,832
STRUCTURAL BEAM
Lars-Birger Lundström, Skellefteå, Sweden, assignor to HB Megaron, Skellefteå, Sweden
Filed Aug. 21, 1984, Ser. No. 642,942
Claims priority, application Sweden, Feb. 21, 1984, 84-0570
Term of patent 14 years
U.S. Cl. D25—77

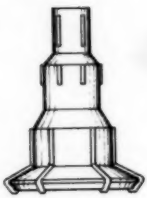


291,833
MANHOLE COVER
John E. (Bud) Shore, 11422 - 75 Avenue, Edmonton, Alberta T5G 0H7; Cornelius P. Smythe, 49 Farrell Properties, 52307 Range Road, 213, Sherwood Park, Alberta T8G 1C1, and Jack W. McKinley, Ste. 207, 9909 - 104 Street, Edmonton, Alberta, all of Canada
Filed May 7, 1984, Ser. No. 608,074
Term of patent 14 years
U.S. Cl. D25—36



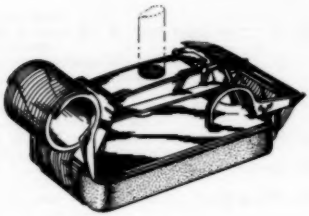
291,834
SYNTHETIC RESIN TUBE
Yoshiyuki Matsui, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Japan
Filed Oct. 22, 1984, Ser. No. 663,721
Claims priority, application Japan, Apr. 24, 1984, 59-16455
Term of patent 14 years
U.S. Cl. D25—73

291,835
LUMINAIRE
Anthony J. Michael, 4205 Adobe Dr., Tallahassee, Fla. 32303
Filed Oct. 29, 1984, Ser. No. 666,160
Term of patent 14 years
U.S. Cl. D26—24

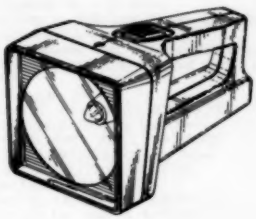


291,836
FLASHLIGHT
Raymond A. Benoit, 9, rue des Peupliers, 78 790 Septeuil, France
Filed Aug. 14, 1984, Ser. No. 640,617
Claims priority, application France, Feb. 15, 1984, 840658
Term of patent 14 years
U.S. Cl. D26—37

291,837
HEAD FOR AN ADHESIVE TAPE CLEANER
Leonard N. Flemming, 326 Blitch St., Valdosta, Ga. 31601
Filed Nov. 13, 1984, Ser. No. 670,298
Term of patent 14 years
U.S. Cl. D32—25



291,838
RECHARGEABLE FLASHLIGHT
Tse T. Tung, New Territories, Hong Kong, assignor to Motor Electric Manufacturing Co., Ltd., Kwai Chung, Hong Kong
Filed Apr. 8, 1985, Ser. No. 721,065
Claims priority, application United Kingdom, Dec. 4, 1984, 1023697
Term of patent 14 years
U.S. Cl. D26—48



291,839
CARPET SCRAPER
Steve Phillips, 910 Wildwood Rd., Mahtomedi, Minn. 55115
Filed Apr. 22, 1985, Ser. No. 725,748
Term of patent 14 years
U.S. Cl. D32—49

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Austin, George K., Jr.; and Lietz, Larry D., 4,691,948, Cl. 292-171.000.

A. Konrad Feinmechanik AG.: *See*—
Stamm, Nikolaus, 4,691,498, Cl. 53-399.000.

A/S Modulex: *See*—
Borresen, Peter A., 4,692,198, Cl. 156-235.000.

A. W. Chesterton Company: *See*—
Sudol, Walter J.; and Habich, Michael P., 4,691,927, Cl. 277-26.000.

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Zorb, Larry D.; and Wicklund, L. Harvey, 4,691,727, Cl. 137-15.000.

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AB Electrolux: *See*—
Andreasson, Bo C.; and Rangert, Bo R., 4,692,753, Cl. 340-671.000.
Blomberg, Peter E.; and Gurt, Sven A., 4,691,529, Cl. 62-332.000.

AB Volvo: *See*—
Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, 4,691,556, Cl. 73-12.000.

Abe, Kazuyoshi: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

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Monsigny, Jean, 4,691,938, Cl. 280-804.000.

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Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., to News Log International, Inc. Method and apparatus for reading a data record carrier. 4,692,913, Cl. 369-44.000.

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Acuto, Giovanni: *See*—
Sburlati, Luigi; Acuto, Giovanni; and Stacchino, Giuseppe, 4,691,946, Cl. 248-429.000.

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Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

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Poduje, Noel S., 4,692,695, Cl. 324-158.00R.

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Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

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Fang, Sheng; and Lee, Sam H., 4,692,634, Cl. 307-272.100.
New, Bernard J., 4,692,888, Cl. 364-728.000.
Sokolovsky, Paul J., 4,691,747, Cl. 140-147.000.

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Santambrogio, Alberto; and Mattei, Luciano, 4,692,170, Cl. 44-63.000.

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Bauman, Bernard D.; and Burdick, Patricia E., 4,692,470, Cl. 521-55.000.

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Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.
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Akebono Brake Industry Co., Ltd.: *See*—
Machara, Toshifumi, 4,691,969, Cl. 303-113.000.
Matsuzaki, Mikio, 4,691,810, Cl. 188-73.100.

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Kratzsch, Eberhard; Cygan, Wolfgang; and Kiss, Nandor, 4,692,365, Cl. 428-87.000.

Albright & Wilson Ltd.: *See*—
Messenger, Edward T.; Mather, Douglas E.; and Phillips, Brinley M., 4,692,271, Cl. 252-354.000.

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Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, 4,692,608, Cl. 250-216.000.

Arbogast, William C., Jr., to AMP Incorporated. Dual slot electrical contact and method of making same. 4,692,121, Cl. 439-874.000.

Arbuthnot, Ian M.; Amm, Errol T.; and Davidson, Raymond J., to Delkor Technik (Proprietory) Ltd. of Delkor House. Apparatus and a method for separating one solid component from another solid component in suspension in a liquid. 4,692,240, Cl. 209-254.000.

Archery Designs, Inc.: *See*—
Peck, Paul L., 4,691,683, Cl. 124-35.00A.

Arensdorf, Stephen C.; Stromgren, Lawrence T.; and Goudreau, Noel, to Strom-Tec, Inc. Knee support. 4,691,697, Cl. 128-80.00L.

Arieh, Simon: *See*—
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, 4,691,535, Cl. 66-144.000.

Arkansas Precision Hydraulics, Inc.: *See*—
Purkott, Hans D., 4,691,617, Cl. 91-167.00R.

Armstrong, Max D., to Williams, Robert J., a part interest. Automatic or standard transmission handling device. 4,691,904, Cl. 269-17.000.

Arnco Corporation: *See*—
Conti, Allen C., 4,692,063, Cl. 405-177.000.

Arneson, Howard M. Article buffing apparatus and method. 4,691,400, Cl. 15-3.000.

Arnold, George D. Mc.: *See*—
Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., 4,691,512, Cl. 60-456.000.

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Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

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Howland, Warren W.; Arquette, Robert E.; and Wu, Shang-Ren, 4,692,169, Cl. 44-51.000.

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Smith, Henry D., Jr.; Arterburn, Russell D.; and Miller, John H., 4,692,178, Cl. 65-2.000.

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Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Takami, Satoshi, 4,692,005, Cl. 354-21.000.

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Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.

Asano, Kozo: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

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Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.

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Asano, Shinzo, 4,691,630, Cl. 101-212.000.

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Le Van Mao, Raymond, 4,692,424, Cl. 502-68.000.

Ashihara, Yoshihiro; and Kasahara, Yasushi, to Fujirebio Kabushiki Kaisha. Method of measuring biological ligand by the use of enzymes. 4,692,404, Cl. 435-5.000.

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Schneider, James T.; and Haugse, Albert L., 4,692,479, Cl. 523-209.000.

Asmussen, Jes: *See*—
Roppel, Thaddeus A.; Asmussen, Jes; and Reinhard, Donnie K., 4,691,662, Cl. 118-50.100.

Aspen Laboratories, Inc.: *See*—
McCune, William L., 4,691,738, Cl. 137-627.500.

AT&T Bell Laboratories: *See*—
Campbell, Eric R.; and Moss, Joe B., 4,692,564, Cl. 174-92.000.
Elliott, Roger A.; and Lindquist, Wayne V., 4,692,918, Cl. 370-85.000.
Shoji, Masakazu, 4,692,637, Cl. 307-443.000.

Atlantic Richfield Company: *See*—
Fudge, Kent D., 4,692,471, Cl. 521-59.000.
Ingram, Alvin R.; and DiGiulio, Adolph V., 4,692,472, Cl. 521-60.000.
Larson, Harold V.; and Gillman, Hyman D., 4,692,535, Cl. 549-542.000.

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Tanaka, Sumio; Saito, Shinji; and Atsumi, Shigeru, 4,692,902, Cl. 365-210.000.

Attwood, Brian E. Harmonic-resonant power supply. 4,692,851, Cl. 363-16.000.

Atwood, Mark T.; Carlson, Frank; and Peterscheck, Hermann, to VerTech Treatment Systems, Inc. Method of removing scale from wet oxidation treatment apparatus. 4,692,252, Cl. 210-761.000.

Aubert, Paul: *See*—
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,691,597, Cl. 74-869.000.

Aubree, Jean: *See*—
Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, 4,692,932, Cl. 375-107.000.

Auburn Gear, Inc.: *See*—
Engle, James L., 4,692,049, Cl. 403-1.000.

Auel, RaeAnn M.; Jolson, Joseph D.; and Stewart, David A., to Mine Safety Appliances Company. Electrochemical determination of formaldehyde. 4,692,220, Cl. 204-1.00T.

Auer, Robert E., to Coulter Corporation. Method of and apparatus for detecting change in the breakoff point in a droplet generation system. 4,691,829, Cl. 209-3.100.

Aug. Winkhaus GmbH & Co. KG: *See*—
Mayer, Siegfried; and Greisner, Paul, 4,691,950, Cl. 292-269.000.

Aul, George N.: *See*—
Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., 4,691,789, Cl. 175-62.000.

Aur Hydropower Limited: *See*—
Smith, Iain M., 4,691,514, Cl. 60-503.000.

Auracher, Franz, to Siemens Aktiengesellschaft. Arrangement for producing a junction between a microstrip line and a coplanar transmission line. 4,692,720, Cl. 333-33.000.

Aurichio, Joseph A.: *See*—
Goswami, Jagadish C.; and Aurichio, Joseph A., 4,692,272, Cl. 252-514.000.

Austin, George K., Jr.; and Lietz, Larry D., to A-DEC, Inc. Fail-secure lock system. 4,691,948, Cl. 292-171.000.

Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., to Board of Regents, University of Washington. Thermal cautery system. 4,691,703, Cl. 128-303.100.

Auto-Flush Systems Ltd.: *See*—
Gilmour, Alfred J., 4,691,748, Cl. 141-165.000.

Automated Tapping Systems Inc.: *See*—
Pfister, William R.; and Pfister, William H., 4,692,072, Cl. 408-124.000.

Automotive Products Plc: *See*—
Maycock, Ian C.; and Hodgson, Derek, 4,691,815, Cl. 192-98.000.
Wimbush, Maurice J., 4,691,814, Cl. 192-91.00A.

AVA International Corporation: *See*—
Akkerman, Neil H.; and Vazquez, Gonzalo, 4,691,893, Cl. 251-14.000.

Aviram, Ari; and Shih, Kwang K., to International Business Machines Corporation. Interface resistance and knee voltage enhancement in resistive ribbon printing. 4,692,044, Cl. 400-241.100.

Avni, Zion: *See*—
Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.

Ayedi, Hassine: *See*—
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.

Azdel, Inc.: *See*—
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., 4,692,375, Cl. 428-299.000.

B. D. Wait Co. Limited: *See*—
Shepherd, Charles G.; and Travale, Samuel, 4,691,689, Cl. 126-295.000.

B. F. Goodrich Company, The: *See*—
Son, Pyong-Nae; and Lai, John T., 4,692,487, Cl. 524-100.000.

Babcock & Wilcox Company, The: *See*—
Wroblewski, David J.; and Robertson, John W., Jr., 4,692,933, Cl. 377-29.000.

Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, to Ciba-Geigy Corporation. Novel compositions based on indanthrone blue pigments. 4,692,189, Cl. 106-308.00S.

Bahl, Surinder K.; Canterino, Peter J.; and Shaw, Richard G., to Mobil Oil Corporation. Films of LLDPE, PP and EPR having improved stiffness, tear and impact strength. 4,692,496, Cl. 525-240.000.

Baier, Paul. Roll shutter for hinged-casement type roof windows. 4,691,753, Cl. 160-32.000.

Baines, Peter J., to Standard Telephones and Cables Public Limited Company. Telephone hook switch. 4,692,940, Cl. 379-424.000.

Baisch, Friedhelm: *See*—
Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., 4,691,695, Cl. 128-38.000.

Ball, Lawrence E.: *See*—
Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., 4,692,502, Cl. 526-193.000.

Balloni, Ricardo: *See*—
Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, 4,692,379, Cl. 428-349.000.

Baltimore Aircoil Company, Inc.: *See*—
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.

Bandara, Upali; and Hinkel, Holger, to International Business Machines Corporation. Method for lowering the frictional coefficient of the magnetic head-disk interface in a lubricated magnetic disk storage system. 4,692,832, Cl. 360-137.000.

Banerjee, Pradip K., to Menley & James Laboratories, Ltd. Compositions and method of controlling transdermal penetration of topical and systemic agents. 4,692,462, Cl. 514-449.000.

Bankers Trust Company: *See*—
Bullock, Joseph J., III, 4,691,834, Cl. 215-232.000.

Banks, Geoffrey T.; and Browning, Paul D., to Imperial Biotechnology Limited. Fermentation process for the production of polysaccharides. 4,692,408, Cl. 435-104.000.

Banks, Ridgway. Laterally oscillating nitinol engine. 4,691,517, Cl. 60-527.000.

Banks, Ridgway. Vertically oscillating heat engine. 4,691,518, Cl. 60-527.000.

Bar-Hai, Giora: *See*—
Borg, Arthur N.; and Bar-Hai, Giora, 4,692,903, Cl. 365-226.000.

Barber, Stephen C. Safety power tool. 4,691,553, Cl. 72-444.000.

Barbier, Marie-Jeanne: *See*—
Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, 4,692,226, Cl. 204-73.00R.

Bardi, Gianluca: *See*—
Lombardini, Lapo; and Bardi, Gianluca, 4,691,534, Cl. 62-55.500.

Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, to Barlian, Reinhold. Electric switch. 4,692,570, Cl. 200-4.000.

Barmag AG: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Barnhart, Ronald W.: *See*—
Wehmeyer, Donald T.; and Barnhart, Ronald W., 4,691,795, Cl. 180-6.480.

Barten, Axel: *See*—
Richter, Gerhard; and Barten, Axel, 4,691,548, Cl. 72-21.000.

Bartholomew, Roy E.: *See*—
Pugh, James G.; Johnson, Duane R.; and Bartholomew, Roy E., 4,691,968, Cl. 303-52.000.

Bascou, Jacques, to Regie Nationale des Usines Renault. Gearmotor for the alternate drive of two operations. 4,691,581, Cl. 74-30.000.

BASF Aktiengesellschaft: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.
Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, 4,692,187, Cl. 71-107.000.
Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, 4,692,527, Cl. 544-405.000.
Welz, Martin; Czauderna, Bernhard; and Stoffel, Karl-Heinz, 4,692,373, Cl. 428-285.000.

Battista, Dino. Bl-brachial motive supplementing device. 4,691,917, Cl. 272-126.000.

Bauer, Kurt; and Schneider, Theodor, to SWF Electric GmbH. Windshield wiper system. 4,692,677, Cl. 318-443.000.

Bauman, Bernard D.; and Burdick, Patricia E., to Air Products and Chemicals, Inc. Process for incorporating powders in viscous fluids. 4,692,470, Cl. 521-55.000.

Baumgartner, Hans-Ulrich: *See*—
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.

Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., to Best Power Technology, Inc; and Pensar Corporation. Method and apparatus for modulating inverter pulse width. 4,692,854, Cl. 363-75.000.

Baxter Travenol Laboratories, Inc.: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.

Bayer Aktiengesellschaft: *See*—
Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, 4,692,550, Cl. 560-345.000.
Hallenbach, Werner; Lindel, Hans; and Brandes, Wilhelm, 4,692,461, Cl. 514-443.000.
Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.
Pedain, Josef; Konig, Klaus; and Schonfelder, Manfred, 4,692,384, Cl. 428-423.300.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Bayraktaroglu, Burhan, to Texas Instruments Incorporated. Monolithic IMPATT with stripline leads. 4,692,791, Cl. 357-81.000.

Beattie, Patrick J., to John D. Brush & Co., Inc. Safe door bushing. 4,691,544, Cl. 70-329.000.

Becavin, Henri G., to Thomson CSF. Feed device for a sweep beam array antenna. 4,692,768, Cl. 342-368.000.

Beck, H. Nelson; and MacWilliams, Dalton C., to Dow Chemical Company, The. Method for imparting flame resistance to wood using dimethyl (oxiranylmethyl) phosphonate and a catalyst. 4,692,355, Cl. 427-297.000.

Beck, Richard L.: *See*—
Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, 4,692,839, Cl. 361-386.000.

Becker, Rainer: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.

Becker, Udo; and Roeschlau, Peter, to Boehringer Mannheim GmbH. Process and a reagent for the simultaneous determination of fibrinogen and fibrinogen fission products in plasma. 4,692,406, Cl. 435-13.000.

Beckman Instruments, Inc.: *See*—
Anthony, Linda J., 4,692,137, Cl. 494-85.000.

Beckwith, Elaine C., to Ford Motor Company. Method of making oxynitrides. 4,692,320, Cl. 423-263.000.

Becton, Dickinson and Company: *See*—
Chantzis, Constantin B., 4,691,702, Cl. 128-207.160.

Beecham Group PLC: *See*—
Buckle, Derek R.; and Carpenter, Stephen T., 4,692,526, Cl. 544-366.000.
Hindley, Richard M.; and Berge, John, 4,692,465, Cl. 514-539.000.

Behlert, Austin. Adjustable gun trigger mechanism. 4,691,461, Cl. 42-69.010.

Beining, August H.; and Smith, William A., to Hughes Aircraft Company. Integrated touch paint system for displays. 4,692,809, Cl. 358-247.000.

Belk, Thomas J., to Ethyl Corporation. Generation of seed particles. 4,691,866, Cl. 241-5.000.

Bell, Joseph P. Antenna extended surface attachment. 4,692,772, Cl. 343-899.000.

Bell, Ronald D. L. Microwave oven warning device. 4,692,580, Cl. 219-10.55M.

Beltran, Adrian M.: *See*—
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,692,644, Cl. 310-178.000.

Bemis, Gerald L., to Advanced Micro Devices, Inc. Overflow/Underflow detection for elastic buffer. 4,692,894, Cl. 364-900.000.

Bencuya, Izak; and Cogan, Adrian I., to GTE Laboratories Incorporated. Junction field effect transistor and method of fabricating. 4,692,780, Cl. 357-22.000.

Bendix France: *See*—
Kervagoret, Gilbert, 4,691,619, Cl. 91-459.000.
Le Marchand, Claude; and Gerard, Jean-Louis, 4,691,809, Cl. 188-71.900.

Bennett, William; and Jimenez, Angel F. Riser pipe elevator. 4,692,081, Cl. 414-22.000.

Benzak, William: *See*—
Rohrbach, Peter; and Benzak, William, 4,691,641, Cl. 104-166.000.

Berard, Raymond A.: *See*—
Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., 4,692,497, Cl. 525-263.000.

Berg, Lloyd, to Celanese Chemical Co. Separation of formic acid from acetic acid by extractive distillation. 4,692,219, Cl. 203-51.000.

Berge, John: *See*—
Hindley, Richard M.; and Berge, John, 4,692,465, Cl. 514-539.000.

Berkhof, Hendrikus, to Honeywell B.V. Differential pressure responsive switch. 4,692,574, Cl. 200-81.500.

Berlin, Richard B.; Berlin, Richard B., Jr.; and Javna, Stephen L. Surgical wound drain device. 4,692,153, Cl. 604-171.000.

Berlin, Richard B., Jr.: *See*—
Berlin, Richard B.; Berlin, Richard B., Jr.; and Javna, Stephen L., 4,692,153, Cl. 604-171.000.

Berliner, Wallace H.: *See*—
Killian, Edmund F.; and Berliner, Wallace H., 4,692,079, Cl. 411-353.000.

Bermudez, Jorge E.: *See*—
Lalin, Hill S.; Bermudez, Jorge E.; and Fleming, William T., 4,691,577, Cl. 73-861.050.

Bernard, Walter J.; and Florio, Steven M., to Sprague Electric Company. Volatile anodizing electrolytes for tantalum. 4,692,224, Cl. 204-56.100.

Berner, Paul C., Jr.: *See*—
Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., 4,691,780, Cl. 166-348.000.

Bernhard, Ragnar: *See*—
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,692,209, Cl. 162-30.100.

Bertholet, Raymond, to Nestec S.A. Preparation of cafestol. 4,692,534, Cl. 549-456.000.

Bessinger, Walter L., to Knape & Vogt Manufacturing Co. Shelf anchor. 4,691,887, Cl. 248-250.000.

Best Power Technology, Inc: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.

Betz, Thomas; von Schnering, Hans-Georg; and Schonherr, Erich, to Hoechst Aktiengesellschaft. Process for making beta-zinc diphosphide monocrystals (whiskers). 4,692,203, Cl. 156-610.000.

Bhatia, Harsaran S.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.

Bibollet, Bernard, to Fonderie Musil. Propeller with removable and adjustable blades. 4,692,097, Cl. 416-207.000.

Bielke, Gernot, to Bruker Medizintechnik GmbH. Method of measuring the nuclear magnetic resonance for use in NMR tomography. 4,692,767, Cl. 324-309.000.

Bieringer, Hermann; and Schwerdtle, Friedhelm, to Hoechst Aktiengesellschaft. Herbicidal compositions. 4,692,181, Cl. 71-86.000.

Biermeier, Johann; and Obermayer, Heinz, to Siemens Aktiengesellschaft. Divided housing for a magnetic disk drive comprising a peripheral sealing ring. 4,692,827, Cl. 360-97.000.

Bilek, Petr: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Bilgic, A. Haluk: *See*—
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Billeaudeaux, James K. Method and apparatus for radiographic inspection. 4,692,936, Cl. 378-59.000.

Billings, Robert L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Flexible inductor. 4,692,604, Cl. 235-493.000.

Billmaier, Joseph F.: *See*—
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

Bingham & Taylor: *See*—
Zinn, Frank R., 4,691,733, Cl. 137-364.000.

Binker, Norman; and Miranda, Sandra. Sanitary napkin with integral disposal wrapper. 4,692,162, Cl. 604-385.00R.

Biodex Corporation: *See*—
Boyd, Robert L.; Krukowski, Richard; and Gezari, Daniel Y., 4,691,694, Cl. 128-25.00R.

Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfart e.V. Apparatus for medical treatments. 4,691,695, Cl. 128-38.000.

Bjareklint, Ake; and Simonsson, Daniel, to ElectroCell AB. Electrode chamber unit for an electro-chemical cell having a porous percolation electrode. 4,692,229, Cl. 204-151.000.

Black, Karl-Heinz; and Schuchardt, Gunter, to Blaupunkt-Werke GmbH. Picture tube screen grid potential control. 4,692,669, Cl. 315-381.000.

Blackman, Seymour N. Parenteral fluid medication reservoir pump. 4,692,151, Cl. 604-132.000.

Blain, William A.; and Zabrodsky, John, III, to Nabisco Brands, Inc.; and Nabisco Brands, Inc. Continuous pretzel dough manufacture. 4,691,625, Cl. 99-348.000.

Blair, Arthur A.: *See*—
Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., 4,691,512, Cl. 60-456.000.

Blattner, Rudolf, to Ciba-Geigy Corporation. Process for the preparation of 1,4-diaminoanthraquinones. 4,692,278, Cl. 260-367.000.

Blaupunkt-Werke GmbH: *See*—
Black, Karl-Heinz; and Schuchardt, Gunter, 4,692,669, Cl. 315-381.000.

Blaze, Kevin L. Electrical measuring apparatus, and methods for determining the condition or identity of biological material. 4,692,685, Cl. 324-61.0QS.

Blohm & Voss AG: *See*—
Otto, Wilheim, 4,691,560, Cl. 73-116.000.

Blomberg, Peter E.; and Gurt, Sven A., to AB Electrolux. Absorption refrigerator for ice-making. 4,691,529, Cl. 62-332.000.

Bloomfield, Philip E.; and Preis, Seymour, to Pennwalt Corporation. Process of preparing nonfibrous, piezoelectric polymer sheet of improved activity. 4,692,285, Cl. 264-22.000.

Bloss, F. Donald, to Electro-tec Corporation. Automatic refractometer. 4,692,024, Cl. 356-135.000.

Bloxom, Ingrid B., Jr. Portable irrigation assembly. 4,692,158, Cl. 604-260.000.

Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., to Procter & Gamble Company, The. Alpha-L-aspartyl-D-heteroaromatic-substituted glycine esters and amides useful as high intensity sweeteners. 4,692,513, Cl. 530-801.000.

Blyler, Lee L., Jr., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber cable. 4,691,989, Cl. 350-96.230.

Board of Regents, University of Washington: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,691,703, Cl. 128-303.100.

Bock, Lawrence A.: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,692,427, Cl. 502-160.000.

Bocker, Richard P.; and Miceli, William J., to United States of America, Navy. Optical floating-point matrix-vector multiplier. 4,692,885, Cl. 364-606.000.

Bodle, William W.; and Tarman, Paul B., to Institute of Gas Tehnology. Solvent extraction of organic oils and solvent recovery. 4,692,238, Cl. 208-407.000.

Bodolus, Christopher L.; and Woodhead, David A., to Standard Oil Company, The. Novel rubber-modified thermoplastic resin compositions. 4,692,498, Cl. 525-285.000.

Boecker, Wolfgang D. G.; and Reini, George I., to STEMCOR Corporation. Sintered silicon carbide/carbon composite ceramic body having fine microstructure. 4,692,418, Cl. 501-90.000.

Boehringer Biochemia Robin, S.p.A.: *See*—
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Boehringer Ingelheim Pharmaceuticals, Inc.: *See*—
Devlin, John P.; and Hargrave, Karl D., 4,692,448, Cl. 514-252.000.

Boehringer Mannheim GmbH: *See*—
Becker, Udo; and Roeschlau, Peter, 4,692,406, Cl. 435-13.000.

Boeing Company, The: *See*—
Ganz, Ulrich W.; and Topness, Paul C., 4,691,561, Cl. 73-117.100.
Gupta, Alankar; and Lloyd, Adam J. P., 4,691,760, Cl. 165-26.000.
King, Ethmer W.; Kircher, Robert C., Jr.; and Yotsuuye, David S., 4,692,869, Cl. 364-448.000.
Viall, Wilton S., Jr., 4,691,944, Cl. 285-348.000.
Wallace, John E., 4,692,578, Cl. 200-175.000.

Bogs, Gunhild: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Bohn, Heinz: *See*—
Fink, Werner; and Bohn, Heinz, 4,692,101, Cl. 417-68.000.

Bohner, Jurgen: *See*—
Schinkel, Ingo; and Bohner, Jurgen, 4,692,386, Cl. 428-515.000.

Boisvenue, Rudolph J., to Eli Lilly and Company. Control of colonial insects employing o-phenylenediamines. 4,692,468, Cl. 514-616.000.

Bokros, Jack C., to CarboMedics, Inc. Heart valve. 4,692,165, Cl. 623-2.000.

Boldt, Clifford R.; and Greene, Richard K., to Celanese Engineering Resins, Inc. Process for preparing oxymethylene polymers using boron trifluoride in admixture with an inert gas. 4,692,505, Cl. 528-241.000.

Boll, Walter: *See*—
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.

Bollen, Theo P. C.; and Cassidy, John E., to Electro-Nite Company. Repeating temperature sensing immersion probe. 4,692,556, Cl. 136-234.000.

Bolotko, Viktor I.: *See*—
Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., 4,692,585, Cl. 219-130.400.

Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, to Malesci S.p.A. Istituto Farmacobiologico. Process for the separation of optical isomers of racemic 1-pyridyl-alkyl-4-aryl piperazines, and optical isomers obtained thereby. 4,692,525, Cl. 544-360.000.

Bonar, George D. Automatic range finder and remote controller braking system. 4,692,764, Cl. 342-71.000.

Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, to Centre National de la Recherche Scientifique (C.N.R.S.). Process for separation of magnesium-based, and possibly fluorine-and aluminum-based impurities from a wet-produced phosphoric acid. 4,692,323, Cl. 423-321.00R.

Bongers, Jozef J. M.; and Van Geenen, Albert A., to Stamicarbon B.V. N-substituted acyl-lactam compound. 4,692,521, Cl. 540-451.000.

Bongers, Jozef J. M.: *See*—
Van Geenen, Albert A.; and Bongers, Jozef J. M., 4,692,520, Cl. 540-451.000.

Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, to Bayerische Motoren Werke Aktiengesellschaft. Installation for the control of the charging cycle in internal combustion engines. 4,691,670, Cl. 123-52.0MF.

Bonnie, Gene P.: *See*—
Jallen, Gale A.; and Bonnie, Gene P., 4,692,898, Cl. 365-27.000.

Bontrager, Ivan W.: *See*—
Mullet, David L.; and Bontrager, Ivan W., 4,691,784, Cl. 172-15.000.

Boogerman, Allan: *See*—
Krohn, Duane D.; and Boogerman, Allan, 4,692,048, Cl. 401-197.000.

Boone, David D., to Lynx Golf, Inc. Golf glove. 4,691,388, Cl. 2-161.00A.

Boostrom, Roy E.: *See*—
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.

Boren, Benjamin E.: *See*—
Whitten, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., 4,691,868, Cl. 241-24.000.

Borg, Arthur N.; and Bar-Hai, Giora, to Zenith Electronics Corporation. Memory loss protection circuit. 4,692,903, Cl. 365-226.000.

Borg-Warner Corporation: *See*—
Novak, Gary J., 4,692,130, Cl. 474-201.000.

Borger, Heinz J.: *See*—
Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., 4,691,695, Cl. 128-38.000.

Borovicka, Antonin: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Borresen, Peter A., to A/S Modulex. Method of printing a pattern on a surface receptive to sublimation printing. 4,692,198, Cl. 156-235.000.

Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., to Hamilton Beach Inc. Electric iron having safety cutoff switch and temperature indicator. 4,692,589, Cl. 219-251.000.

Botez, Dan, to RCA Corporation. Phase-locked laser array. 4,692,925, Cl. 372-46.000.

Bothe, Lothar: *See*—
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,692,837, Cl. 361-313.000.

Bouadma, Noureddine; Brillouet, Francois; and Kampfer, Angelika. Process for the production of an integrated laser-photodetector structure. 4,692,207, Cl. 156-649.000.

Bouchette, Michael P., to James River Corporation. Antimicrobially active, non-woven web used in a wet wiper. 4,692,374, Cl. 428-288.000.

Bouldin, Eric; Haddock, Richard; and Dyball, Christopher J., to Drexler Technology Corporation. Ultrathin optical recording medium with moisture barrier. 4,692,402, Cl. 430-945.000.

Bourke, Robert F.: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.

Bowering, Robert H.: *See*—
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., 4,692,350, Cl. 427-138.000.

Boyd, Robert L.; Krukowski, Richard; and Gezari, Daniel Y., to Biodex Corporation. Muscle exercise and rehabilitation apparatus. 4,691,694, Cl. 128-25.00R.

Boyle, Raymond F.: *See*—
DeMario, Edmund E.; Boyle, Raymond F.; and Kuchirka, Peter J., 4,692,302, Cl. 376-439.000.

Braden, William L., to Damon Biotech, Inc. Method and apparatus for forming droplets and microcapsules. 4,692,284, Cl. 264-4.300.

Bradley, John J., to Paper Converting Machine Company. Apparatus for interfolding. 4,691,908, Cl. 270-21.100.

Bradshaw, Thomas I.: *See*—
Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., 4,691,993, Cl. 350-105.000.

Bradwell, Paul R.: *See*—
Marsden, Peter; and Bradwell, Paul R., 4,692,358, Cl. 427-421.000.

Brandes, Wilhelm: *See*—
Hallenbach, Werner; Lindel, Hans; and Brandes, Wilhelm, 4,692,461, Cl. 514-443.000.

Brandl, Gerhard: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Brandt, Louis. Anti-theft trailer assembly and trailer hitch lock. 4,691,935, Cl. 280-507.000.

Branston, Randolph E.: *See*—
Ober, Christopher K.; and Branston, Randolph E., 4,692,188, Cl. 106-23.000.

Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., to Cauzin Systems, Incorporated. Optical reader for printed bit-encoded data and method of reading same. 4,692,603, Cl. 235-454.000.

Braun, Douglas J.: *See*—
Carlson, Larry M.; and Braun, Douglas J., 4,691,600, Cl. 82-4.00C.

Bray, Bernard D., to GTE Communication Systems Corporation. Method for adjusting and testing current sensors. 4,692,696, Cl. 324-158.00R.

Bray, Bernard D., to GTE Communication Systems Corporation. Current sensor adjustment and test apparatus. 4,692,697, Cl. 324-158.00R.

Bremer, Ross L. Tibial torsion splint with multiple degrees of freedom of adjustment. 4,691,698, Cl. 128-80.00R.

Breunig, Walter: *See*—
Pietzsch, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, 4,692,943, Cl. 382-8.000.

Bridgeport Metal Goods Mfg. Co., The: *See*—
Ahrens, Warren S., 4,691,833, Cl. 215-227.000.

Brierley, Rowland J. P.: *See*—
Wem, James; and Brierley, Rowland J. P., 4,692,283, Cl. 261-89.000.

Brightad Limited: *See*—
Street, Graham S. B., 4,692,792, Cl. 358-3.000.

Brillouet, Francois: *See*—
Bouadma, Noureddine; Brillouet, Francois; and Kampfer, Angelika, 4,692,207, Cl. 156-649.000.

Brimmer, Craig A. Bait holder and method for making. 4,691,467, Cl. 43-44.400.

Bristol-Myers Company: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,692,531, Cl. 548-193.000.
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.
Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, 4,692,538, Cl. 558-6.000.

British Aerospace PLC: *See*—
Young, Ronald W., 4,691,882, Cl. 244-158.00R.

British Telecommunications: *See*—
Reeve, Michael H.; and Cassidy, Stephen A., 4,691,896, Cl. 254-134.400.

Brochand, Max, to Pomagalski. Rope coupling carriage having concave track between grips. 4,691,643, Cl. 104-202.000.

Broitman, Kalman: *See*—
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Brossi, Arnold, to United States of America, Health and Human Services. Antiinflammatory 2,3-didemethylcolchicine and additional derivatives. 4,692,463, Cl. 514-463.000.

Brostik, Miroslav: *See*—
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

Brother Albert Welsh Foundation: *See*—
Kennedy, Michael, 4,691,763, Cl. 165-54.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hirota, Akio, 4,692,071, Cl. 408-9.000.

Brotz, Gregory R. Method of producing a continuous length structure. 4,692,286, Cl. 264-29.100.

Brown, Boveri & Cie AG: *See*—
Reiss, Harald; and Ziegenbein, Botho, 4,692,363, Cl. 428-36.000.

Brown, Francis J., to Deniston Company. Strobe adaptor for automotive timing light. 4,692,668, Cl. 315-241.00S.

Brown, George T., Jr., to American Thermometer Co., Inc. Device for detecting, measuring, and recording body thermal emissivity. 4,691,712, Cl. 125-736.000.

Brown, Oswald. Bivalve mollusk shucker. 4,691,412, Cl. 17-74.000.

Brown, Robert D., Jr.: *See*—
Riley, William D.; and Brown, Robert D., Jr., 4,692,875, Cl. 364-497.000.

Brown, Robert L.; and Stewart, Elizabeth C. Skin cleanser capable of softening and removing smegma. 4,692,262, Cl. 252-106.000.

Brown, William G., II. Solar power generation. 4,691,522, Cl. 60-641.800.

Browne Brothers, Inc.: *See*—
Browne, Donald V., 4,691,505, Cl. 56-503.000.

Browne, Donald V., to Browne Brothers, Inc. Stalk shredder for self-propelled cotton stripper. 4,691,505, Cl. 56-503.000.

Browning, Joseph M.: *See*—
James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., 4,692,321, Cl. 423-404.000.

Browning, Norman F.: *See*—
Alsobrook, Lawrence C.; and Browning, Norman F., 4,691,469, Cl. 43-54.100.

Browning, Paul D.: *See*—
Banks, Geoffrey T.; and Browning, Paul D., 4,692,408, Cl. 435-104.000.

Bruker Medizintechnik GmbH: *See*—
Bielke, Gernot, 4,692,767, Cl. 324-309.000.

Bruner, Harold S., Jr., to Du Pont de Nemours, E. I., and Company. Carboalkoxylation of butadiene to form dialkyl adipate. 4,692,549, Cl. 560-204.000.

Brunet, Maurice L.; and Jolivet, Jean-Pierre, to Societe Anonyme Styled: Societe Europeenne de Propulsion. Radial displacement magnetic detector device for a rotor. 4,692,699, Cl. 324-207.000.

Brunswick Corporation: *See*—
Staerzl, Richard E., 4,691,680, Cl. 123-491.000.

Brunton, Loren F. M-16 rifle, improved to more safely accomodate left handed shooters. 4,691,615, Cl. 89-33.400.

Bruso, Loran H., to Warner-Lambert Company. Adjustable test pack. 4,692,307, Cl. 422-58.000.

Brustle, Klaus: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,691,408, Cl. 16-241.000.

Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, to Konstructa Trencin, narodny podnik. Anaesthetical circuit with reverse inhalation equipped with an injector of escaped anaesthetics. 4,691,700, Cl. 128-200.210.

Brym, Stanley J.: *See*—
Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

Buckle, Derek R.; and Carpenter, Stephen T., to Beecham Group PLC. Process for preparing benzopyrano (2,3-d) triazoles. 4,692,526, Cl. 544-366.000.

Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., to Security Tag Systems, Inc. Recording-tape-reel assembly with electronic tag. 4,692,746, Cl. 340-572.000.

Buekers, Josef: *See*—
Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.

Bullock, Joseph J., III, to Bankers Trust Company. Cap and neck structure for a wide mouth jar. 4,691,834, Cl. 215-232.000.

Bunker Plastics, Inc.: *See*—
Parkinson, William S.; and Djerf, Villy E., 4,692,372, Cl. 428-282.000.

Bunker, Robert L. Portable tree seat and platform for standing. 4,691,804, Cl. 182-187.000.

Burdick, Patricia E.: *See*—
Bauman, Bernard D.; and Burdick, Patricia E., 4,692,470, Cl. 521-55.000.

Burghardi, Stephen R., to Domain, Inc. Drying composition and method. 4,692,265, Cl. 252-194.000.

Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, to Barmag AG. Yarn texturing nozzle. 4,691,947, Cl. 28-255.000.

Burnett, Tobias W. T.: *See*—
Schlonski, James S.; and Burnett, Tobias W. T., 4,692,297, Cl. 376-211.000.

Burns, Timothy L.: *See*—
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

Burr-Brown Corporation: *See*—
Highton, Frederick J., 4,692,641, Cl. 307-475.000.

Burton, Clement D.: *See*—
Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., 4,692,615, Cl. 250-231.00R.

Burton Mechanical Contractors, Inc.: *See*—
Grooms, John M.; and Jones, Mark A., 4,691,731, Cl. 137-205.000.

Buschulte, Winfried: *See*—
Farago, Zoltan; and Buschulte, Winfried, 4,692,319, Cl. 423-242.000.

Bussing, Wilfred C., Jr. Wearable alarm. 4,692,749, Cl. 340-574.000.

Butler, George. Artificial aquarium. 4,691,459, Cl. 40-406.000.

Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., to International Business Machines Corporation. Digital timing control system with memory look ahead. 4,692,877, Cl. 364-514.000.

Caesar, Philip D., to Mobil Oil Corporation. Method for preparing structured catalytic solids. 4,692,423, Cl. 502-62.000.

Cahill, Jerry E.: *See*—
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.

Calderara, Reto: *See*—
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.

Calmar, Inc.: *See*—
Anderson, Walter F., 4,692,103, Cl. 417-547.000.

Cambridge Technologies, Inc.: *See*—
Holdt, Donald H., 4,691,962, Cl. 297-84.000.

Camco, Incorporated: *See*—
Pringle, Ronald E., 4,691,776, Cl. 166-319.000.

Cameron Iron Works, Inc.: *See*—
Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., 4,691,780, Cl. 166-348.000.

Campbell, Eric R.; and Moss, Joe B., to American Telephone & Telegraph Company, AT&T Technologies, Inc.; and AT&T Bell Laboratories. Cable support system. 4,692,564, Cl. 174-92.000.

Campbell, Henry F.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,692,445, Cl. 514-212.000.

Campbell, Steve G., to Quantum Corporation. Magnetically biased aerodynamically released integral safety latch for rigid disk drive. 4,692,829, Cl. 360-105.000.

Caneer, Clifford, Jr. Gas control system for a plasma arc welding apparatus. 4,692,584, Cl. 219-121.0PU.

Canon Kabushiki Kaisha: *See*—
Ando, Yujiro; and Kaneko, Shuzo, 4,692,779, Cl. 346-153.100.
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.
Hasumi, Hiroyuki, 4,692,777, Cl. 346-140.00R.
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Izukawa, Kazuhiro; and Ishizuka, Kho, 4,692,649, Cl. 310-316.000.
Kiuchi, Masayoshi, 4,692,014, Cl. 354-471.000.
Makita, Masaru, 4,692,045, Cl. 400-697.000.
Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.
Okino, Tadashi, 4,692,013, Cl. 354-413.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.
Okuno, Takuo, 4,692,672, Cl. 318-116.000.
Saito, Asao; and Watanabe, Kunio, 4,692,773, Cl. 346-1.100.
Seki, Hiroyuki; and Okuno, Takuo, 4,692,652, Cl. 310-323.000.
Toyoda, Yasuhiro; Shimada, Fumio; and Yoshida, Katsumi, 4,692,009, Cl. 354-246.000.
Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, 4,692,914, Cl. 369-49.000.
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,692,778, Cl. 346-145.000.

Canterino, Peter J.: *See*—
Bahl, Surinder K.; Canterino, Peter J.; and Shaw, Richard G., 4,692,496, Cl. 525-240.000.

Capps, Grover. Surveyor's level with constant instrument height and method. 4,691,444, Cl. 33-290.000.

CarboMedics, Inc.: *See*—
Bokros, Jack C., 4,692,165, Cl. 623-2.000.

Card, Joseph L.; and Card, Roy T., to Card-Monroe Corporation. Knife holder for tufting machine. 4,691,646, Cl. 112-80.600.

Card-Monroe Corporation: *See*—
Card, Joseph L.; and Card, Roy T., 4,691,646, Cl. 112-80.600.

Card, Roy T.: *See*—
Card, Joseph L.; and Card, Roy T., 4,691,646, Cl. 112-80.600.

Cardiovascular Systems Inc.: *See*—
Feldman, Louis W.; and Yawn, David H., 4,692,136, Cl. 494-38.000.

Cargill, N. Allen; and Malashkin, Michail, to Technitrol, Inc. Document dispenser. 4,691,910, Cl. 271-3.000.

Cari-All Inc.: *See*—
Trubiano, Antoine, 4,691,816, Cl. 194-212.000.

Carl Still GmbH & Co. KG, Firma: *See*—
Lemke, Otto; and Krause, Manfred, 4,692,217, Cl. 202-151.000.

Carl-Zeiss-Stiftung: *See*—
Muchel, Franz, 4,691,997, Cl. 350-503.000.

Carlson, Curtis R.: *See*—
Anderson, Charles H.; and Carlson, Curtis R., 4,692,806, Cl. 358-209.000.

Carlson, Frank: *See*—
Atwood, Mark T.; Carlson, Frank; and Peterscheck, Hermann, 4,692,252, Cl. 210-761.000.

Carlson, Larry M.; and Braun, Douglas J. Pipe shaver. 4,691,600, Cl. 82-4.00C.

Carmichael, Kenneth, to Peerless Machine & Tool Corporation. Anti-jamming die. 4,691,604, Cl. 83-164.000.

Carpenter, Peter F., to ALZA Corporation. System for providing intravenously administrable drug formulation. 4,692,144, Cl. 604-56.000.

Carpenter, Stephen T.: *See*—
Buckle, Derek R.; and Carpenter, Stephen T., 4,692,526, Cl. 544-366.000.

Carson, John R., to McNeilab, Inc. Cyclopenta[b]thiophenes having anti-inflammatory activity similar to steroids. 4,692,460, Cl. 514-443.000.

Carstersen, Gail: *See*—
Johnson, Randall, 4,692,846, Cl. 362-104.000.

Carstersen, Ronald: *See*—
Johnson, Randall, 4,692,846, Cl. 362-104.000.

Carter, Charles G., to Stauffer Chemical Company. Method for preparation of mercaptobenzoates. 4,692,545, Cl. 360-18.000.

Casals, Jorge: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Casciari, Raoul: *See*—
Raj, Kuldip; and Casciari, Raoul, 4,692,826, Cl. 360-97.000.

Casey, Frank, to General Engineering Radcliffe Limited. Vacuum coating apparatus. 4,692,233, Cl. 204-298.000.

Casio Computer Co., Ltd.: *See*—
Hashidate, Katsuro, 4,692,887, Cl. 364-720.000.
Nakano, Harumi, 4,692,601, Cl. 235-380.000.
Sasaki, Hiroyuki; and Hanzawa, Kohtaro, 4,691,608, Cl. 84-1.010.

Casper, Daniel F., to International Business Machines Corp. Buffer system using parity checking of address counter bit for detection of read/write failures. 4,692,893, Cl. 364-900.000.

Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, to Hoffmann-La Roche Inc. Phenyl-pyrimidinium, thiazolium or imidazolium salts and use in inhibiting intestinal resorption of cholesterol and bile salts. 4,692,450, Cl. 514-256.000.

Cassani, Giovanni: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.

Cassidy, John E.: *See*—
Bollen, Theo P. C.; and Cassidy, John E., 4,692,556, Cl. 136-234.000.

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Reeve, Michael H.; and Cassidy, Stephen A., 4,691,896, Cl. 254-134.400.

Castille, Leopold A. Holder for small parts. 4,691,903, Cl. 269-6.000.

Catalysts & Chemicals Industries Co., Inc.: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.

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Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Cauzin Systems, Incorporated: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Cavalli, Alfredo. Steam generating apparatus for different household application outlets. 4,692,588, Cl. 219-245.000.

Cavigli, Mario; and Ferrari, Lorenzo, to Kinglor-LTD. Self-baking electrode for electric arc furnaces and the like. 4,692,929, Cl. 373-89.000.

Celanese Chemical Co.: *See*—
Berg, Lloyd, 4,692,219, Cl. 203-51.000.

Celanese Corporation: *See*—
Davenport, Kenneth G., 4,692,546, Cl. 560-130.000.
Dotson, Duane L.; and Forschirm, Alex, 4,692,168, Cl. 44-7.100.
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

Celanese Engineering Resins, Inc.: *See*—
Boldt, Clifford R.; and Greene, Richard K., 4,692,505, Cl. 528-241.000.

Cellucap Manufacturing Company: *See*—
McKeown, Thomas J., 4,691,390, Cl. 2-200.000.

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Jacobina, Charles E., 4,692,477, Cl. 521-174.000.

Center, Warren A., to K. W. Thompson Tool Company, Inc. Sight system for a firearm. 4,691,442, Cl. 33-253.000.

Centre National de la Recherche Scientifique (C.N.R.S.): *See*—
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.

Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, to SPOFA, spojene podniky pro zdravotnickou

vyrobu. Method for treatment of endometritis in mammalian females. 4,692,452, Cl. 514-288.000.
Cesano, Franco, to G.O.R. Applicazioni Speciali S.p.A. Mold for the covering and trimming of products of plastics material. 4,692,108, Cl. 425-292.000.
Ceskoslovenska akademie ved: *See—*
Porsch, Bedrich; Voslar, Jaroslav; and Rosol, Jaroslav, 4,692,243, Cl. 210-198.200.
CGEE Alsthom Direction Red, Societe Anonyme: *See—*
Andrieux, Alain; Trequilly, Yves; and Lavoine, Jean-Claude, 4,692,841, Cl. 361-395.000.
Chaabouni, Mohamed: *See—*
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.
Chabala, Leonard V.: *See—*
Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., 4,692,734, Cl. 337-162.000.
Chace, Mark S.: *See—*
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.
Chandler, Jimmy E.: *See—*
Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, 4,692,880, Cl. 364-521.000.
Chang, Chin-Hsiung, to UOP Inc. Process for separating ketoses from alkaline- or pyridine-catalyzed isomerization products. 4,692,514, Cl. 536-127.000.
Chang, Jun H., to FMC Corporation. Herbicidal isoxazolidinone derivatives. 4,692,182, Cl. 71-88.000.
Chang, Nelson: *See—*
Lin, Weng-Pin; and Chang, Nelson, 4,691,992, Cl. 350-99.000.
Chantzis, Constantin B., to Becton, Dickinson and Company. Aspirating device. 4,691,702, Cl. 128-207.160.
Chase, Lee: *See—*
Hegland, Philip; and Chase, Lee, 4,692,616, Cl. 250-252.100.
Checkpoint Systems, Inc.: *See—*
Wolf, Albert E., 4,692,747, Cl. 340-572.000.
Chemical Process Corporation: *See—*
Viswanathan, Tito; and Westermann, Donald H., 4,692,478, Cl. 527-300.000.
Chen, Cheng-Ming. Multi-purpose lighter assembly. 4,692,112, Cl. 431-253.000.
Chen, Henry C. J.: *See—*
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.
Cherne Industries, Inc.: *See—*
Mathison, Allen D., 4,691,728, Cl. 137-15.000.
Chi, Charles H. Method and apparatus for protecting press from being damaged by overload conditions. 4,692,857, Cl. 364-184.000.
Chiang, Yulin: *See—*
Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, 4,692,538, Cl. 558-6.000.
Chichester, Willard L.: *See—*
Wright, Allen B.; and Chichester, Willard L., 4,692,177, Cl. 55-499.000.
Chigasaki, Mitsuo: *See—*
Nihei, Masayasu; Suwa, Masateru; and Chigasaki, Mitsuo, 4,692,230, Cl. 204-192.310.
Chism, Samuel B., Jr., to Ford Aerospace & Communications Corporation. Passively modulated push broom display. 4,692,808, Cl. 358-231.000.
Chiu, Chui-Wen. Domestic electric kiln. 4,692,593, Cl. 219-362.000.
Cho, Michio, to Fuji Photo Film Co., Ltd. Wide-angle photographic lens. 4,691,996, Cl. 350-465.000.
Choay, Jean: *See—*
Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, 4,692,435, Cl. 514-56.000.
Choay, S.A.: *See—*
Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, 4,692,435, Cl. 514-56.000.
Christidis, Yani: *See—*
Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, 4,692,226, Cl. 204-73.00R.
Christy, Ronald S.: *See—*
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.
Chronar Corporation: *See—*
Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, 4,692,558, Cl. 136-258.000.
Chugai Ro Co., Ltd.: *See—*
Imose, Masayuki, 4,691,898, Cl. 266-89.000.
Chung, Alfred: *See—*
Ryan, James W.; and Chung, Alfred, 4,692,437, Cl. 514-165.000.
Ryan, James W.; and Chung, Alfred, 4,692,458, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,692,459, Cl. 514-362.000.
Chung, David Y.: *See—*
Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., 4,692,268, Cl. 252-33.400.
Chung, Ki Ho, to Samhwa Electric Industrial Co. Safety device for communication equipment. 4,692,833, Cl. 361-91.000.
Church, John F.; and Stone, Walter H., to Parker Hannifin Corporation. Filter assembly with high pressure connection to collection bowl. 4,692,245, Cl. 210-232.000.
Cianci, James P.; and Gross, James R., to Kendall Company, The. Tamper evident band. 4,692,150, Cl. 604-111.000.
Ciba-Geigy Corporation: *See—*
Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, 4,692,189, Cl. 106-308.00S.
Blattner, Rudolf, 4,692,278, Cl. 260-367.000.
Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.
Gugumus, Francois, 4,692,486, Cl. 524-100.000.
Hassig, Robert, 4,692,524, Cl. 544-303.000.
Illy, Hugo; Schliebs, Bjorn; and Hess, Wilhelm, 4,692,540, Cl. 558-78.000.
Lang, Robert W., 4,692,536, Cl. 556-413.000.
Rasberger, Michael; Dubs, Paul; and Evans, Samuel, 4,692,258, Cl. 252-50.000.
Spivack, John D.; Ravichandran, Ramanathan; and Pastor, Stephen D., 4,692,532, Cl. 548-312.000.
Spivack, John D., 4,692,539, Cl. 558-78.000.
Watthey, Jeffrey W. H., 4,692,469, Cl. 514-651.000.
Ciccarelli, Angelo. Dental floss applicator. 4,691,719, Cl. 132-92.00R.
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, to Boehringer Biochemia Robin, S.p.A. Tricyclic dihydropyridazinones and pharmaceutical compositions containing them. 4,692,447, Cl. 514-248.000.
Ciongoli, Bernard M., to Ampower Technologies, Inc. Three-dimensional spatial image system. 4,692,878, Cl. 364-518.000.
Cipolla, Piervitto: *See—*
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.
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Lilley, Raymond A., 4,691,491, Cl. 52-481.000.
Claesen, Christianus A. A.: *See—*
Tesser, Godefridus I.; and Claesen, Christianus A. A., 4,692,542, Cl. 558-184.000.
Clark, David G., to U.S. Philips Corporation. Device for generating a 2-axis control signal. 4,692,756, Cl. 340-709.000.
Clarke, Alan: *See—*
Taylor, Peter J.; Clarke, Alan; and Thompson, John S., 4,691,510, Cl. 60-39.094.
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., to Mobil Oil Corporation. Asphalt coating method. 4,692,350, Cl. 427-138.000.
Clarke, John: *See—*
Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, 4,692,732, Cl. 335-302.000.
Claude, John P.: *See—*
Ingle, Frank W.; and Claude, John P., 4,691,418, Cl. 29-25.350.
Clear, Kenneth C. Cathodic protection of reinforced concrete in contact with conductive liquid. 4,692,066, Cl. 405-216.000.
Clegg, Roy, to Davy McKee (Sheffield) Limited. Rolling mill control for tandem rolling. 4,691,546, Cl. 72-9.000.
Clift, Miner E. Reverse-buckling rupture disk with replaceable disk and blade. 4,691,729, Cl. 137-68.100.
Clifton, Kevin; and Delaney, Sean, to Clifton, Kevin. Central air conditioning system. 4,691,531, Cl. 62-263.000.
Cline, David E.: *See—*
Willyard, Dewey L., Jr.; Cline, David E.; and Wulfhorst, David E., 4,691,423, Cl. 29-156.40R.
Coffman, Leonard: *See—*
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,692,644, Cl. 310-178.000.
Cogan, Adrian I.: *See—*
Bencuya, Izak; and Cogan, Adrian I., 4,692,780, Cl. 357-22.000.
Cohen, Donald M., to Cordis Corporation. Apparatus for measuring velocity of blood flow in a blood vessel. 4,691,709, Cl. 128-667.000.
Cohen, Leonard G.; Johnson, David W., Jr.; and MacChesney, John B., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber with depressed index outer cladding. 4,691,990, Cl. 350-96.330.
Coldren, Daniel R., to AMP Incorporated. Tab-form terminal. 4,691,981, Cl. 439-816.000.
Coleman, Albert L.: *See—*
Wesner, Charles R.; Yancey, John F.; and Coleman, Albert L., 4,692,868, Cl. 364-447.000.
Colgate-Palmolive Company: *See—*
Sonenstein, Gerard G., 4,692,494, Cl. 525-57.000.
Collier, L. Warren, IV: *See—*
Taylor, Jack D.; and Collier, L. Warren, IV, 4,692,368, Cl. 428-137.000.
Collobert, Daniel: *See—*
Anizan, Paul; Collobert, Daniel; and Massaloux, Dominique, 4,692,892, Cl. 364-807.000.
Columbia Gas System Service Corp: *See—*
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Commander Electrical Materials, Inc.: *See—*
Nattel, William, 4,692,561, Cl. 174-65.0SS.
Nattel, William, 4,692,562, Cl. 174-65.0SS.
Commissariat a l'Energie Atomique: *See—*
Lance, Jacques; and Muller, Georges, 4,691,425, Cl. 29-402.080.
Prulhiere, Jean-Paul, 4,692,692, Cl. 324-102.000.
Rabeyrolles, Serge, 4,692,693, Cl. 324-123.00R.
Commons, Thomas J.: *See—*
Skotnicki, Jerauld S.; and Commons, Thomas J., 4,692,517, Cl. 540-222.000.
Communications Test Design, Inc.: *See—*
Parsons, Donald F., 4,692,939, Cl. 379-16.000.

Conant, Curtis T., to American Magnetics Corporation. Apparatus for sensing and/or writing information on cards, passports and checks and the like. 4,692,602, Cl. 235-446.000.
Condor-Werk Gebr. Frede GmbH & Co. KG: *See*—
Frede, Dieter, 4,692,576, Cl. 200-84.00R.
Connell, Eugene W.: *See*—
Elkins, William; Connell, Eugene W.; and Short, Robert E., 4,691,762, Cl. 165-46.000.
Conner, John M.: *See*—
Conner, Leo B., Jr.; and Conner, John M., 4,691,692, Cl. 126-422.000.
Conner, Leo B., Jr.; and Conner, John M. Solar energy system with delayed drain-back. 4,691,692, Cl. 126-422.000.
Conrad, Bernhard; and Tressl, Guenther, to Siemens Aktiengesellschaft. Apparatus for converting radiation image information carried by a storage layer into a television signal sequence. 4,692,813, Cl. 358-294.000.
Conrad, Raymond W.: *See*—
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.
Conti, Allen C., to Arnco Corporation. System to control tension in a cable during underground placement. 4,692,063, Cl. 405-177.000.
Control Data Corp.: *See*—
Jallen, Gale A.; and Bonnie, Gene P., 4,692,898, Cl. 365-27.000.
Convey, Frank H., Jr., to Harris Graphics Corporation. Apparatus for placing a card on a bundle of sheet-like articles. 4,691,502, Cl. 53-529.000.
Cook, F. Bert: *See*—
Reid, Edward A.; Cook, F. Bert; and Purvis, Edgar M., 4,691,532, Cl. 62-476.000.
Cook's Truck Body Mfg., Inc.: *See*—
Hodge, Harold F., 4,691,956, Cl. 296-51.000.
Cool Water Corporation, The: *See*—
Crowell, William H., 4,691,664, Cl. 119-61.000.
Cooley, Stephen E.; and Jensen, Martin J., to Wehr Corporation. Humidifier controller having multiple-phase electrode current sensor. 4,692,591, Cl. 219-295.000.
Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, to Fuji Photo Optical Company, Ltd. Compact optical imaging system. 4,692,608, Cl. 250-216.000.
Cope, Paul E. G.: *See*—
Wilson, David J. M.; and Cope, Paul E. G., 4,692,614, Cl. 250-231.00R.
Coradi, Michael D.; and Vitalbo, Carl A., to Westinghouse Electric Corp. Analog process control system testing. 4,692,298, Cl. 376-215.000.
Cordell, Henry L.; and Galer, David G. Method and apparatus for gasifying solid organic materials. 4,691,846, Cl. 222-198.000.
Cordis Corporation: *See*—
Cohen, Donald M., 4,691,709, Cl. 128-667.000.
Kane, James, 4,691,708, Cl. 128-667.000.
Cordwell, Brian; and Hayes, Paul M., to Plessey Overseas Limited. Read only memory control circuit for use in a phase lock loop. 4,692,713, Cl. 331-1.00A.
Cormed, Inc.: *See*—
Hilger, Gerald E., 4,692,146, Cl. 604-93.000.
Corning Glass Works: *See*—
Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., 4,692,615, Cl. 250-231.00R.
Corsetti, John A. Waterbed frames. 4,691,395, Cl. 5-400.000.
Cortese, Richard: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,692,336, Cl. 424-468.000.
Costa, Lorenzo F.; Harrington, David C.; and Miller, Raymond S., to Eastman Kodak Company. Solid scintillator counting compositions. 4,692,266, Cl. 252-301.170.
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, to Mayer & Cie. GmbH & Co.; and Sipra Patentientwicklungs - und Beteiligungsgesellschaft mbH. Method of and apparatus for joining a selected yarn to a yarn being knitted. 4,691,535, Cl. 66-144.000.
Cotteret, Jean: *See*—
Junino, /.lex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, 4,692,166, Cl. 8-410.000.
Cotterill, Michael J. Keyboard support. 4,691,888, Cl. 248-284.000.
Cottrell, Henry L.; and Venturi, William L., to Cottrell, Henry Lloyd. Conduit couplings. 4,691,945, Cl. 285-419.000.
Cottrell, Henry Lloyd: *See*—
Cottrell, Henry L.; and Venturi, William L., 4,691,945, Cl. 285-419.000.
Coulter Corporation: *See*—
Auer, Robert E., 4,691,829, Cl. 209-3.100.
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, to Jeumont-Schneider Corporation. Rapid message transmission system between computers and method. 4,692,862, Cl. 364-200.000.
Coutant, Patrick: *See*—
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,691,597, Cl. 74-869.000.
Cowen, Judith A., to LRC Electronics, Inc. Coaxial cable tap connector. 4,691,976, Cl. 439-394.000.
Cox, Frederick E.: *See*—
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,692,499, Cl. 525-524.000.
Crabbe, Edwin P., Jr., to GTE Communication Systems Corporation. Arrangement for dynamic range checking or matching for digital values in a software system. 4,692,897, Cl. 364-900.000.
Crafco, Inc.: *See*—
Schave, Floyd D., 4,692,028, Cl. 366-22.000.
Craig Systems Corporation: *See*—
Anderson, Thomas L., 4,691,483, Cl. 52-79.100.
Crain, Steven P.: *See*—
Wang, Pen-Chung; and Crain, Steven P., 4,692,533, Cl. 548-312.000.
Crandall, Richard S.: *See*—
Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., 4,692,344, Cl. 427-39.000.
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, to Hoechst Aktiengesellschaft. Coextruded, biaxially oriented, multi-layer and capacitor made therefrom. 4,692,837, Cl. 361-313.000.
Creative Metal Designs Ltd.: *See*—
Kane, Patrick J., 4,691,492, Cl. 52-519.000.
Creissels, Denis. Multicable cable-car or gondola lift. 4,691,642, Cl. 104-173.100.
Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,692,531, Cl. 548-193.000.
Crescentini, Lamberto: *See*—
James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., 4,692,321, Cl. 423-404.000.
Crew, Albert W.; Ghrist, William D., III; and Remley, Gilbert W., to Westinghouse Electric Corp. Testing sensor signal processors. 4,692,299, Cl. 376-216.000.
Cribbs, Timothy B.: *See*—
Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.
Crisci, Victor. Vehicle flasher. 4,692,736, Cl. 340-81.00R.
Criss, Russell C.: *See*—
Gillery, F. Howard; and Criss, Russell C., 4,692,389, Cl. 428-622.000.
Cross Company, The: *See*—
Smith, Michael D.; and Dobat, Daniel F., 4,692,074, Cl. 409-233.000.
Crowell, William H., to Cool Water Corporation, The. Pet receptacle. 4,691,664, Cl. 119-61.000.
Crum, Donald L. Electric fence holder. 4,692,567, Cl. 174-158.00F.
CTB, Inc.: *See*—
Frush, Donald R., 4,691,897, Cl. 256-65.000.
Cuff, William A.; and Lefler, Jerrold P., to Digitext, Inc. Computerized printing system. 4,692,042, Cl. 400-94.000.
Cullen, John C.; Cullen, Paul M.; and Cullen, Owen. Mock linking process and apparatus for joining two pieces of knitted fabric, and knitted edging trim for use therewith. 4,691,537, Cl. 66-172.00R.
Cullen, Owen: *See*—
Cullen, John C.; Cullen, Paul M.; and Cullen, Owen, 4,691,537, Cl. 66-172.00R.
Cullen, Paul M.: *See*—
Cullen, John C.; Cullen, Paul M.; and Cullen, Owen, 4,691,537, Cl. 66-172.00R.
Cummins Atlantic, Inc.: *See*—
Willyard, Dewey L., Jr.; Cline, David E.; and Wulfhorst, David E., 4,691,423, Cl. 29-156.40R.
Cygan, Wolfgang: *See*—
Kratzsch, Eberhard; Cygan, Wolfgang; and Kiss, Nandor, 4,692,365, Cl. 428-87.000.
Czauderna, Bernhard: *See*—
Welz, Martin; Czauderna, Bernhard; and Stoffel, Karl-Heinz, 4,692,373, Cl. 428-285.000.
Czepl, Helmut: *See*—
Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, 4,692,026, Cl. 356-345.000.
Czuba, Leonard: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.
Dahbura, Anton T.; and Sabnani, Krishan K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method for generating verification tests. 4,692,921, Cl. 371-27.000.
Dahl, Randy L., to Motorola, Inc. Turbine alternator with a central clear optical path. 4,692,631, Cl. 290-55.000.
Dahlke, Hannelore: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.
Dai-Ichi Seiko Kabushiki Kaisha: *See*—
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Daido Tokushuko Kabushiki Kaisha: *See*—
Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, 4,691,899, Cl. 266-140.000.
Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, 4,691,874, Cl. 242-80.000.
Daimler-Benz Aktiengesellschaft: *See*—
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.
Grantz, Helmut; and Odebrecht, Wolfgang, 4,691,949, Cl. 292-216.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Ikuta, Kunio, 4,692,879, Cl. 364-518.000.
Yamada, Mitsuhiko; Fujisawa, Kyohei; and Kitamura, Hideaki, 4,692,796, Cl. 358-76.000.

Dalal, Vikram L.: *See*—
Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, 4,692,558, Cl. 136-258.000.

Dale Electronics, Inc.: *See*—
Person, Herman R.; Raesner, Dennis L.; and Meints, Gayle L., 4,692,655, Cl. 313-15.000.

Damon Biotech, Inc.: *See*—
Braden, William I., 4,692,284, Cl. 264-4.300.

Dana-Farber Cancer Institute, Inc.: *See*—
Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, 4,692,405, Cl. 435-7.000.

Danforth, Ronald V.; and Pleau, Medric H., to Packaging Systems International, Inc. Lid sealing machine. 4,691,500, Cl. 53-478.000.

Darner, John T.: *See*—
Peel, Robert M.; and Darner, John T., 4,691,922, Cl. 273-177.00B.

Das, Suryya K.; and Kania, Charles M., to PPG Industries, Inc. Coating compositions comprising free radical addition polymers with cross-linkable integral isocyanato groups. 4,692,503, Cl. 526-301.000.

Das, Suryya K.: *See*—
Ranka, Ajay I.; and Das, Suryya K., 4,692,491, Cl. 524-458.000.

Dattagupta, Nanibhushan, to Molecular Diagnostics, Inc. Radioactive labeling of proteins with nucleosides or nucleotides. 4,692,509, Cl. 530-303.000.

Davenport, Kenneth G., to Celanese Corporation. Process for producing acyloxy aromatic carboxylic acids. 4,692,546, Cl. 560-130.000.

Davidson, Raymond J.: *See*—
Arbuthnot, Ian M.; Amm, Errol T.; and Davidson, Raymond J., 4,692,240, Cl. 209-254.000.

Davis, Michael H. Method and composition for in vivo radiolabeling of red blood cells with ^{99m}Tc. 4,692,324, Cl. 424-1.100.

Davis, William L. Comestible beater. 4,692,029, Cl. 366-149.000.

Davy McKee (Sheffield) Limited: *See*—
Clegg, Roy, 4,691,546, Cl. 72-9.000.

Day International Corporation: *See*—
Haren, Doyle V.; and Wiley, Lawrence V., 4,691,432, Cl. 29-527.200.

Dearborn Chemicals Limited: *See*—
Greaves, Brian; and Ingham, Paul, 4,692,315, Cl. 422-18.000.
Greaves, Brian; and Grenside, Stuart J., 4,692,316, Cl. 422-16.000.

Debaudringhien, Andre, to Dictaphone Corporation. One-way clutch assembly with pawl and ratchet. 4,692,825, Cl. 360-96.300.

de Brie Perry, Forbes G., to National Research Development Corporation. Continuously-variable ratio transmission. 4,691,592, Cl. 74-691.000.

Decowski, Stanley J., Jr.: *See*—
Puletti, Paul P.; and Decowski, Stanley J., Jr., 4,692,161, Cl. 604-366.000.

Decrouen, Jean-Michel: *See*—
Fabien, Raymond; and Decrouen, Jean-Michel, 4,692,204, Cl. 156-626.000.

Deere & Company: *See*—
Frerich, Josef, 4,691,503, Cl. 53-587.000.
Trumbauer, David V.; Fosbinder, Larry L.; and Erion, Terry L., 4,691,754, Cl. 164-9.000.

Deftos, Leonard J.: *See*—
Hostetler, Karl Y.; and Deftos, Leonard J., 4,692,433, Cl. 514-12.000.

Deguchi, Hiroyuki: *See*—
Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, 4,691,526, Cl. 62-217.000.

Dehydro Corporation, The: *See*—
Stannard, Forrest B.; and Highstreet, Edward J., 4,692,248, Cl. 210-403.000.

Deiana, Salvatore. Self-adjusting breakwater for artificial harbors. 4,691,661, Cl. 114-267.000.

DeKezel, James A.; and Lerschen, James R. Buoyant water fowl decoy and method for making same. 4,691,463, Cl. 43-3.000.

Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, to Chronar Corporation. Counteraction of semiconductor impurity effects. 4,692,558, Cl. 136-258.000.

DeLand, Daniel L.; and LaVene, Leon F., to Schmelzer Corporation. Quick connect fluid fitting assembly. 4,691,943, Cl. 285-315.000.

Delaney, Sean: *See*—
Clifton, Kevin; and Delaney, Sean, 4,691,531, Cl. 62-263.000.

Delatorre, Leroy C. Capacitance transducer. 4,691,574, Cl. 73-708.000.

Delkor Technik (Proprietory) Ltd. of Delkor House: *See*—
Arbuthnot, Ian M.; Amm, Errol T.; and Davidson, Raymond J., 4,692,240, Cl. 209-254.000.

DeLong, Sanford D., to DeLong, Sanford D. Electromagnetic reciprocating pump and motor means. 4,692,673, Cl. 318-132.000.

Delphax Systems: *See*—
Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, 4,692,017, Cl. 355-3.0DD.

De Marchi, Andrea; and Rovera, Giovanni D., to DeMarchi, Andrea. Method and a device for the frequency control of an atomic or molecular beam frequency standard. 4,692,716, Cl. 331-3.000.

DeMarchi, Andrea: *See*—
De Marchi, Andrea; and Rovera, Giovanni D., 4,692,716, Cl. 331-3.000.

DeMario, Edmund E.; Boyle, Raymond F.; and Kuchirka, Peter J., to Westinghouse Electric Corp. Coolant flow mixer grid for a nuclear reactor fuel assembly. 4,692,302, Cl. 376-439.000.

Demin, Vladislav M.: *See*—
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

DeMoore, Howard W. Method and apparatus for attaching anti-smear net to printing press transfer cylinder. 4,691,632, Cl. 101-426.000.

Dempsey, Edward J. Sawblade collar assembly. 4,691,685, Cl. 125-14.000.

Demukai, Noboru: *See*—
Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, 4,691,899, Cl. 266-140.000.

De Muro, David M.: *See*—
Green, Steven R.; De Muro, David M.; and Sokola, Raymond L., 4,692,726, Cl. 333-206.000.

Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, to Alcatel. Triplicated clock distribution device for use when each clock signal comprises a synchonization signal. 4,692,932, Cl. 375-107.000.

Deniston Company: *See*—
Brown, Francis J., 4,692,668, Cl. 315-241.00S.

Denning, Ralph M., to Rolls-Royce plc. Compound helicopter and powerplant therefor. 4,691,877, Cl. 244-6.000.

de Riel, Stanton R.: *See*—
Kitchell, Judith P.; and de Riel, Stanton R., 4,692,328, Cl. 424-78.000.

de Sartre, Jean; and Maige, Philippe, to Thomson-CSF. Control circuit for a chopped power supply with progressive start up. 4,692,853, Cl. 363-49.000.

DeSoto, Inc.: *See*—
Roberts, Donald R., 4,692,484, Cl. 523-414.000.

Dessouroux, Alexis A. J., to Shur-lok International S.A. Nut device having automatic positive locking. 4,692,078, Cl. 411-231.000.

Deters, Joseph C.: *See*—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,692,326, Cl. 424-15.000.

Deubzer, Bernward: *See*—
Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

Deutsch, Daniel H. Microporous coating for solid members to reduce stress, wear and fatigue at liquid interfaces. 4,692,376, Cl. 428-315.500.

Deutsche Filterbau GmbH: *See*—
Roos, Hans, 4,692,173, Cl. 55-96.000.

Deutsche Forschungs- und Versuch-Sanstalt fur Luft- und Raumfahrt E.V.: *See*—
Farago, Zoltan; and Buschulte, Winfried, 4,692,319, Cl. 423-242.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfart e.V.: *See*—
Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., 4,691,695, Cl. 128-38.000.

DeVeau, George F., Jr.: *See*—
Aberson, James A., Jr.; DeVeau, George F., Jr.; Mathis, Terry D.; and Miller, Calvin M., 4,691,986, Cl. 350-96.210.

Devlin, John P.; and Hargrave, Karl D., to Boehringer Ingelheim Pharmaceuticals, Inc. Bis(arylpiperazinyl)sulfur compounds. 4,692,448, Cl. 514-252.000.

De Vrieze, Henricus M.: *See*—
Khoe, Giok D.; and De Vrieze, Henricus M., 4,692,208, Cl. 156-659.100.

Dewitz, Thomas S.: *See*—
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Dhyanchand, P. John: *See*—
Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,692,671, Cl. 318-11.000.

Diamond, Betty A., to Yeshiva University. Monoclonal antibodies reactive with shared idiotypes on human antibodies to native DNA from patients with systemic lupus erythematosus. 4,692,416, Cl. 436-508.000.

Dickens, Judith F.; and Loughlin, John J. Medical apparatus and system. 4,691,710, Cl. 128-673.000.

Dictaphone Corporation: *See*—
Debaudringhien, Andre, 4,692,825, Cl. 360-96.300.

Didier-Werke Ag: *See*—
Dobner, Gerd-Erich, 4,691,901, Cl. 266-236.000.

Diehl, Herbert: *See*—
Huschelrath, Gerhard; and Diehl, Herbert, 4,692,702, Cl. 324-251.000.

Diesel Kiki Co., Ltd.: *See*—
Otsuka, Shojiro; and Komada, Hideaki, 4,691,674, Cl. 123-299.000.

Dietzel, Klaus. Method and apparatus for making a pressure hose socket. 4,691,550, Cl. 72-68.000.

Diffracto, Ltd.: *See*—
Pryor, Timothy R., 4,692,884, Cl. 364-573.000.

Digital Equipment Corporation: *See*—
Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, 4,692,839, Cl. 361-386.000.

Digitext, Inc.: *See*—
Cuff, William A.; and Lefler, Jerrold P., 4,692,042, Cl. 400-94.000.

DiGiulio, Adolph V.: *See*—
Ingram, Alvin R.; and DiGiulio, Adolph V., 4,692,472, Cl. 521-60.000.

Dignam, Bernard J., deceased; and Dignam, Bonnie M., heiress. Sutureless infusion cannula for ophthalmic surgery. 4,692,142, Cl. 604-51.000.

Dignam, Bonnie M., heiress: *See*—
Dignam, Bernard J., deceased; and Dignam, Bonnie M., heiress, 4,692,142, Cl. 604-51.000.

Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., to Phillips Petroleum Company. Apparatus for producing carbon black. 4,692,312, Cl. 422-151.000.

Dillon, Linwood E. Garbage can. 4,691,837, Cl. 220-1.00T.

DiMucci, Vito A.: *See*—
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.

Dionne, Robert. Device for preventing unauthorized removal of portable objects. 4,691,891, Cl. 248-551.000.

Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, to Sundstrand Corporation. Electrically-compensated constant speed drive. 4,692,671, Cl. 318-11.000.

Dispenziere, Nicholas C., Jr.: *See*—
Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., 4,692,428, Cl. 502-254.000.

Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, to FAG Kugelfischer Georg Schafer KGaA. Friction clutch operated pressure modulator. 4,691,813, Cl. 192-13.00R.

Dive N'Surf: *See*—
Meistrell, Robert W., 4,692,002, Cl. 351-156.000.

Diversified Products Corporation: *See*—
Rockwell, Gary L., 4,691,918, Cl. 272-134.000.

Divis, Richard T.: *See*—
Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., 4,692,312, Cl. 422-151.000.

Djerf, Villy E.: *See*—
Parkinson, William S.; and Djerf, Villy E., 4,692,372, Cl. 428-282.000.

Dobat, Daniel F.: *See*—
Smith, Michael D.; and Dobat, Daniel F., 4,692,074, Cl. 409-233.000.

Dobner, Gerd-Erich, to Didier-Werke Ag. Gas rinsing stopper preventing mixing of air with rinsing gas. 4,691,901, Cl. 266-236.000.

Dobson Park Industries Plc.: *See*—
Ward, Richard; and Allen, Archelaius D., 4,692,067, Cl. 405-302.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Mueller, Robert, 4,691,593, Cl. 74-714.000.

Dr. Ludwig Pietzsch GmbH: *See*—
Pietzsch, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, 4,692,943, Cl. 382-8.000.

Dodman, Nicholas H.; and Shuster, Louis, to Tufts College, Trustees of. Method for preventing stereotypic behavior in animals. 4,692,451, Cl. 514-282.000.

Dohi, Takashi; Shibata, Nobuho; and Ohara, Kenichi, to Matsushita Electric Industrial Co., Ltd. Sewing machine driving apparatus. 4,692,676, Cl. 318-269.000.

Dohi, Takashi: *See*—
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,691,653, Cl. 112-275.000.

Dollison, William W., to Otis Engineering Corporation. Hydraulic well pump. 4,691,511, Cl. 60-414.000.

Domain, Inc.: *See*—
Burghardi, Stephen R., 4,692,265, Cl. 252-194.000.

Domeratzky, Joachim: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Donahue, Robert L.: *See*—
Hamilton, Harold F.; and Donahue, Robert L., 4,691,443, Cl. 33-288.000.

Donkerbrook, Deborah: *See*—
Johnson, Randall, 4,692,846, Cl. 362-104.000.

Donovan, Kevin M.: *See*—
Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, 4,692,379, Cl. 428-349.000.

Dooley, Patrick D. Gaff for landing fish. 4,691,465, Cl. 43-5.000.

Dorina Nahmaschinen GmbH: *See*—
Meier, Willi, 4,691,654, Cl. 112-303.000.

Dorn, Alfred, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Control device using light-emitting diodes for both manual input and display of data. 4,692,739, Cl. 340-365.00P.

Dorsey, John W.: *See*—
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

dos Santos Copia, Carlos R., to Maquinas NPU Ltda. Machine for making unitized stacks of bags. 4,692,134, Cl. 493-196.000.

Dosaka, Katsumi: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.

Dotson, Duane L.; and Forschurm, Alex, to Celanese Corporation. Flammable barrier wrap for solid fuel/firestarter composition. 4,692,168, Cl. 44-7.100.

Dove, Albert W.: *See*—
New, Dane S.; and Dove, Albert W., 4,691,658, Cl. 114-66.000.

Dove, Norman F. Adjustment device for a lip of a headbox slice. 4,692,213, Cl. 162-259.000.

Dover Molded Products Company, The: *See*—
Ullman, Myron, 4,691,839, Cl. 220-281.000.

Dow Chemical Company, The: *See*—
Beck, H. Nelson; and MacWilliams, Dalton C., 4,692,355, Cl. 427-297.000.
Dunbar, Joseph E.; and Maruyama, Kimiaki, 4,692,467, Cl. 514-609.000.
Hall, Mark J.; and Hyun, Kun S., 4,692,508, Cl. 528-503.000.
Hefner, Robert E., Jr., 4,692,500, Cl. 525-529.000.
Malhotra, Sudarshan K.; and Evoy, Ingrid L., 4,692,183, Cl. 71-94.000.
Wang, Pen-Chung; and Crain, Steven P., 4,692,533, Cl. 548-312.000.
Weller, Joseph P., 4,692,431, Cl. 502-417.000.

Dowell Schlumberger Incorporated: *See*—
Kucera, Clare H., 4,692,254, Cl. 252-8.551.
Nelson, Erik B., 4,691,774, Cl. 166-291.000.

Dowling, Donald J.: *See*—
Mazzagatti, Roy P.; and Dowling, Donald J., 4,692,706, Cl. 324-338.000.

Doyle, Terrence W.: *See*—
Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, 4,692,538, Cl. 558-6.000.

Drach, George W.: *See*—
Rosenberg, Helmut W. G.; and Drach, George W., 4,692,149, Cl. 604-99.000.

Dragerwerk AG: *See*—
Pannwitz, Karl-Heinz, 4,692,309, Cl. 422-87.000.

Drent, Eit, to Shell Oil Company. Process for the preparation of unsaturated compounds. 4,692,548, Cl. 560-202.000.

Dresser Industries, Inc.: *See*—
Lustig, Lee M.; and Ellis, Gary D., 4,691,775, Cl. 166-317.000.

Drexler, Jerome, to Drexler Technology Corporation. Method of forming a personal information card. 4,692,394, Cl. 430-140.000.

Drexler Technology Corporation: *See*—
Bouldin, Eric; Haddock, Richard; and Dyball, Christopher J., 4,692,402, Cl. 430-945.000.
Drexler, Jerome, 4,692,394, Cl. 430-140.000.

Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, to Hoechst Aktiengesellschaft. Process for the preparation of glyoxylic hemiacetal esters. 4,692,547, Cl. 560-186.000.

Drummond, George S.: *See*—
Kappas, Attallah; and Drummond, George S., 4,692,440, Cl. 514-185.000.
Rideout, Darryl; Kappas, Attallah; and Drummond, George S., 4,692,439, Cl. 514-185.000.

Dubs, Paul: *See*—
Rasberger, Michael; Dubs, Paul; and Evans, Samuel, 4,692,258, Cl. 252-50.000.

Duff Norton Company: *See*—
Ferguson, George R., 4,691,452, Cl. 34-119.000.

Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., to Sun Refining and Marketing Company. Phosphite-promoted rutheniumcobalt catalysts for the dealkoxyhydroxymethylation of acetals to form glycol ethers. 4,692,426, Cl. 502-154.000.

Duggan, Stephen R., to Medtronic, Inc. Drug administration device. 4,692,147, Cl. 604-93.000.

Duke, Christopher C.: *See*—
Varnum, Gerald F.; and Duke, Christopher C., 4,691,573, Cl. 73-702.000.

Dunan, Andrew J., to Solitec Limited. Material discharge apparatus. 4,691,843, Cl. 222-58.000.

Dunbar, Joseph E.; and Maruyama, Kimiaki, to Dow Chemical Company, The. N'-cyano-n-tetrahydrownaphthyl-s-methyisothiourea as a growth promoting agent. 4,692,467, Cl. 514-609.000.

Dundas, Robert E.; and Tatar, Fred W., to Factory Mutual Research. Method of testing steam turbine rotors to determine if they should be retired because of embrittlement. 4,692,701, Cl. 324-240.000.

Dunn, William J.; and Silver, Brian H., to Kendall Company, The. Acoustic coupling assembly with retaining connector for noninvasive sensing of sampling chamber fluid. 4,691,557, Cl. 73-32.00A.

Dunsmore, Jerry L.: *See*—
Kerr, Jack R.; Shelton, Thomas V.; and Dunsmore, Jerry L., 4,692,077, Cl. 411-206.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bruner, Harold S., Jr., 4,692,549, Cl. 560-204.000.
Erhardt, Paul W.; and Matier, William L., 4,692,446, Cl. 514-234.000.
Hahn, Marlyn E., 4,691,971, Cl. 439-78.000.
Kelly, Renee J., 4,692,481, Cl. 523-219.000.
LeRoux, Donald F.; and Stottlemyer, Quayton R., 4,692,083, Cl. 414-411.000.
Manring, Lewis E.; and Mazur, Stephen, 4,692,360, Cl. 427-443.100.
Reich, Shymon, 4,692,387, Cl. 428-545.000.
Shenvi, Ashokkumar B., 4,692,528, Cl. 546-115.000.
Wang, Ying, 4,692,636, Cl. 307-427.000.

Durbin, John A.: *See*—
Loce, Robert P.; Rees, James D.; and Durbin, John A., 4,692,015, Cl. 355-1.000.

Durckheimer, Walter: *See*—
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.

Durham, Dana, to American Hoechst Corporation. Process of using photoresist treating composition containing a mixture of a hexa-alkyl disilazane, propylene glycol alkyl ether and propylene glycol alkyl ether acetate. 4,692,398, Cl. 430-329.000.

Durst, Felix, to Allenspach, Norbert. Heat exchanger unit with support ring and radial brackets. 4,691,764, Cl. 165-68.000.

Dusch, Albert, to Pfaff Industriemaschinen GmbH. Lockswitch sewing machine having a rotary hook. 4,691,650, Cl. 112-231.000.

Dyball, Christopher J.: *See*—
Bouldin, Eric; Haddock, Richard; and Dyball, Christopher J., 4,692,402, Cl. 430-945.000.

Dyma, Horst; and Heindke, Armin, to Mannesmann Kienzle GmbH. Document encoder. 4,692,041, Cl. 400-82.000.

Dymax Corporation: *See*—
Matzuk, Terrance, 4,691,571, Cl. 73-632.000.

Dymenko, Vladimir V.: *See*—
Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., 4,692,585, Cl. 219-130.400.

Dynamit Nobel Aktiengesellschaft: *See*—
Mattarelli, Ennio, 4,691,462, Cl. 42-75.040.

Dynapert-HTC Corp.: *See*—
Waldron, Gerald E.; and Wilson, Edward J., 4,692,114, Cl. 432-198.000.

Dynatech Corporation: *See*—
Kitchell, Judith P.; and de Riel, Stanton R., 4,692,328, Cl. 424-78.000.

Dynic Corporation: *See*—
Ikeda, Sakio; and Yonamine, Shozen, 4,691,717, Cl. 131-365.000.

Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., to Moskovskoe Vysshee Tekhnicheskoe Uchilische, Imeni N.E. Baumana. Bioprosthetic heart valve, methods and device for preparation thereof. 4,692,164, Cl. 623-2.000.

E. R. Squibb & Sons, Inc.: *See*—
Gordon, Eric M., 4,692,455, Cl. 514-332.000.

E-Systems, Inc.: *See*—
Harris, Mark A., 4,692,724, Cl. 333-202.000.

Eastman Kodak Company: *See*—
Costa, Lorenzo F.; Harrington, David C.; and Miller, Raymond S., 4,692,266, Cl. 252-301.170.
House, Gary L., 4,692,401, Cl. 430-570.000.

Eaton Corporation: *See*—
Hoppie, Lyle O., 4,691,682, Cl. 123-558.000.

Ebaugh, Roger L.; and Rhodes, Jerry P., to Torrington Company, The. Multirow roller bearing with seals between the races. 4,692,040, Cl. 384-484.000.

Ebenhack, Ben W.; and Floran, Robert J., to Union Oil Company of California. Process for obtaining permeability logs using radioactive drilling mud additives. 4,691,772, Cl. 166-254.000.

Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, to Hale Fire Pump Company. Gasoline engine EMI suppression system. 4,691,667, Cl. 123-633.000.

Eberhardt, Werner; and Ziegler, Rudolf, to Henkel Kommanditgesellschaft auf Aktien. Stripping paste for removing lacquer and paint coatings. 4,692,263, Cl. 252-122.000.

Eberle, William J. Vacuum sensitive switch. 4,692,575, Cl. 200-82.00C.

Ebertz, Wolfgang: *See*—
Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, 4,692,547, Cl. 560-186.000.

Ebinger, Gunther: *See*—
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.

Ebner, Emanual C., Jr.: *See*—
Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., 4,691,987, Cl. 350-96.230.

Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., to Itek Graphix Corp. Optical fiber cable producer and method of bonding optical fibers to light emitting diodes. 4,691,987, Cl. 350-96.230.

Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., to ALZA Corporation. Dispenser comprising inner positioned soft or hard capsule. 4,692,326, Cl. 424-15.000.

Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., to ALZA Corporation. Self controlled release device for administering beneficial agent to recipient. 4,692,336, Cl. 424-468.000.

Ecolab Inc.: *See*—
Nystuen, David L., 4,691,721, Cl. 134-96.000.

Economy Engineering, Inc.: *See*—
Wehmeyer, Donald T.; and Barnhart, Ronald W., 4,691,795, Cl. 180-6.480.

Economy, Richard: *See*—
Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, 4,692,880, Cl. 364-521.000.

Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., to Scott & Fetzer Company, The. Rotation indicating device. 4,692,754, Cl. 340-671.000.

Edenhofer, Albrecht: *See*—
Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, 4,692,450, Cl. 514-256.000.

Edwards, William J.: *See*—
Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., 4,691,547, Cl. 72-16.000.

Ehrig, Dietrich; and Jacobs, Hans-Juergen, to ERNO Raumfahrttechnik GmbH. Hot gas engine operating in accordance with the stirling principle. 4,691,515, Cl. 60-526.000.

Ehrlenspiel, Klaus; John, Thomas; and Streinz, Wolfgang, to Uni-Cardan Aktiengesellschaft. Claw coupling assembly for torque transmission. 4,692,126, Cl. 464-103.000.

Eidos Corporation: *See*—
Rudolph, Thomas E., 4,691,464, Cl. 43-3.000.

Ekola, Kenneth E. Tension transducer. 4,691,579, Cl. 73-862.480.

Ekstrom, Michael P.; and Havira, R. Mark, to Schlumberger-Doll Research. Method and apparatus for investigating stand-off in a borehole. 4,692,908, Cl. 367-27.000.

El Paso Products Company: *See*—
Ficker, Harold K.; and Teskin, Frederick M., 4,692,489, Cl. 524-243.000.

Electro-Nite Company: *See*—
Bollen, Theo P. C.; and Cassidy, John E., 4,692,556, Cl. 136-234.000.

Electro-tec Corporation: *See*—
Bloss, F. Donald, 4,692,024, Cl. 356-135.000.

ElectroCell AB: *See*—
Bjareklint, Ake; and Simonsson, Daniel, 4,692,229, Cl. 204-151.000.

Electronic Design & Research, Inc.: *See*—
Shvartsman, Vladimir A., 4,692,709, Cl. 328-108.000.
Shvartsman, Vladimir A., 4,692,710, Cl. 328-111.000.

Elektro-Physik Hans Nix & Dr.-Ing. E. Steingroever KG: *See*—
Nix, Hans F., 4,692,700, Cl. 324-229.000.

Eli Lilly and Company: *See*—
Boisvenue, Rudolph J., 4,692,468, Cl. 514-616.000.
Hertel, Larry W., 4,692,434, Cl. 514-49.000.
Katner, Allen S., 4,692,443, Cl. 514-206.000.
Lord, Gary E., 4,692,518, Cl. 540-224.000.

Elkins, William; Connell, Eugene W.; and Short, Robert E., to Life Support Systems, Inc. Personal temperature control system. 4,691,762, Cl. 165-46.000.

Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., to Caterpillar Inc. Apparatus and method for wrapping an external tape support about a filter element assembly. 4,692,196, Cl. 156-187.000.

Ellingson, David R.: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.

Ellingson, Hartley, to Frontier, Inc. Roll-tight tarp system. 4,691,957, Cl. 296-98.000.

Ellion, M. Edmund; and Wolff, George, to Hughes Aircraft Company. Thin GaAs solar cell structures. 4,692,559, Cl. 136-262.000.

Elliott, Roger A.; and Lindquist, Wayne V., to AT&T Bell Laboratories. Reliable local data network arrangement. 4,692,918, Cl. 370-85.000.

Ellis, Gary D.: *See*—
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Ellis, Stafford M., to GEC Avionics Limited. Electric circuit module arrangements. 4,692,840, Cl. 361-393.000.

Elloway, Russell: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Elscint Ltd.: *See*—
Shimoni, Yair; Fenster, Paul; and Nissenson, Bilha, 4,692,864, Cl. 364-414.000.

Eltek S.p.A.: *See*—
Fornasari, Paolo, 4,691,516, Cl. 60-527.000.

Elter, Claus: *See*—
Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, 4,692,301, Cl. 376-391.000.

Emde, Carsten, to Fresnius AG. Medical tube. 4,692,152, Cl. 604-164.000.

Emhart Industries, Inc.: *See*—
Merchant, David E., 4,692,838, Cl. 361-380.000.

Endo, Sasuke. Brush for applying material in liquid or emulsion form. 4,692,047, Cl. 401-141.000.

Energy Transportation Group Inc.: *See*—
Tornay, Edmund, 4,691,660, Cl. 114-248.000.

Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, to Bayer Aktiengesellschaft. Continuous process for thermal splitting of carbamic acid esters. 4,692,550, Cl. 560-345.000.

Engelbach, Thomas S. System for automatically preventing turnover of two wheeled vehicles. 4,691,798, Cl. 180-209.000.

Engineered Air Systems, Inc.: *See*—
Mutchler, Paul A., 4,691,687, Cl. 126-104.00A.

Engle, James L., to Auburn Gear, Inc. Quick disengagement apparatus for power wheel mechanisms. 4,692,049, Cl. 403-1.000.

Engstrom, David A. Spanner for torsion springs and method for its use. 4,691,428, Cl. 29-426.600.

Enomoto, Akio, to NGK Insulators, Ltd.; and Mizutani, Isao. Condensation resistant electrode for use in a dielectric heating apparatus. 4,692,581, Cl. 219-10.810.

Enomoto, Yuji: *See*—
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.

Environmental Research Institute of Michigan: *See*—
Politis, Demetrios T.; and Licata, William H., 4,692,765, Cl. 342-106.000.

Epitestudomanyi Intezet & Konnyuipari Szerelo es Epito Vallalat: *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Ergomed: *See*—
Landau, Boris; and Saines, Marius, 4,692,157, Cl. 604-214.000.

Erhardt, Paul W.; and Matier, William L., to Du Pont de Nemours, E. I., and Company. Esters of aryloxypropanolamine derivatives and medicinal uses. 4,692,446, Cl. 514-234.000.

Erion, Terry L.: *See*—
Trumbauer, David V.; Foshinder, Larry L.; and Erion, Terry L., 4,691,754, Cl. 164-9.000.

Ernest, Ivan: *See*—
Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.

ERNO Raumfahrttechnik GmbH: *See*—
Ehrig, Dietrich; and Jacobs, Hans-Juergen, 4,691,515, Cl. 60-526.000.

Ernst Schmutz GmbH: *See*—
Mierswa, Christian; and Schmutz, Friedrich, 4,691,723, Cl. 134-167.00C.

Erski, Richard, to NAP Consumer Electronics Corp. Apparatus for generating oscilloscope trigger signals. 4,692,802, Cl. 358-139.000.

Erwin, Edward R. Device to monitor press fittings. 4,692,775, Cl. 346-118.000.

Erwin Sick GmbH Optik Elektronik: *See*—
von Stein, Walter, 4,691,647, Cl. 112-80.180.

Escache, Gerard: *See*—
Godfrin, Jean-Philippe; Landrevie, Bernard; and Escache, Gerard, 4,691,633, Cl. 102-202.000.

Eser, Erter: *See*—
Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, 4,692,558, Cl. 136-258.000.

Esselborn, Eberhard: *See*—
Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, 4,692,267, Cl. 252-321.000.

Essig, Gunder: *See*—
Sander, Wilfried; Essig, Gunder; and Wacker, Erich, 4,691,622, Cl. 92-233.000.

ETA SA Fabriques d'Ebauches: *See*—
Mock, Elmar; and Gabus, Georges A., 4,692,033, Cl. 368-280.000.

Etani, Kenji. Water treatment systems. 4,692,314, Cl. 422-265.000.

Ethyl Corporation: *See*—
Belk, Thomas J., 4,691,866, Cl. 241-5.000.
Shin, Kju H., 4,692,555, Cl. 568-722.000.

Eucatex S.A. Industria e Comercio of Sao Paulo: *See*—
Roberts, James R., 4,692,211, Cl. 162-147.000.

Evangelista, Richard A.: *See*—
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Evans, Rhys M.: *See*—
Mueller, Allan H.; Perkins, Dean P.; and Evans, Rhys M., 4,692,912, Cl. 367-190.000.

Evans, Samuel: *See*—
Rasberger, Michael; Dubs, Paul; and Evans, Samuel, 4,692,258, Cl. 252-50.000.

Evoy, Ingrid L.: *See*—
Malhotra, Sudarshan K.; and Evoy, Ingrid L., 4,692,183, Cl. 71-94.000.

Ewikon Entwicklung und Konstruktion GmbH & Co.: *See*—
Muller, Walter, 4,692,595, Cl. 219-421.000.

Ex-Cell-O Corporation: *See*—
Gray, John D., 4,692,293, Cl. 264-245.000.

Excel Industries, Inc.: *See*—
Mullet, David L.; and Bontrager, Ivan W., 4,691,784, Cl. 172-15.000.

Extance, Philip; Jones, Roger E.; and Martin, Stewart O., to Standard Telephones and Cables Public Limited Company. Magnetic field sensor having a Hall effect device with overlapping flux concentrators. 4,692,703, Cl. 324-251.000.

Exxon Chemical Patents Inc.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.

Exxon Nuclear Company, Inc.: *See*—
Osborne, Jon L., 4,692,303, Cl. 376-446.000.

Exxon Research and Engineering Company: *See*—
Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., 4,692,268, Cl. 252-33.400.
Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., 4,692,428, Cl. 502-254.000.

F.B.M. Hudon Italiana S.p.A.: *See*—
Nardella, Massimiliano, 4,692,100, Cl. 416-232.000.

F. F. Mengel Company: *See*—
Mengel, William F., 4,692,058, Cl. 404-72.000.

Fabien, Raymond; and Decrouen, Jean-Michel, to U.S. Philips Corporation. Method of planarizing the surface of a semiconductor device, in which silicon nitride is used as isolating material. 4,692,204, Cl. 156-626.000.

Factory Mutual Research: *See*—
Dundas, Robert E.; and Tatar, Fred W., 4,692,701, Cl. 324-240.000.

FAG Kugelfischer Georg Schafer KGaA: *See*—
Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, 4,691,813, Cl. 192-13.00R.

Falconer, Ralph A.: *See*—
Johnson, Bruce R.; and Falconer, Ralph A., 4,691,732, Cl. 137-268.000.

Falk, Gerhard, to Robert Bosch GmbH. Control and energization circuit for a brushless d-c motor. 4,692,675, Cl. 318-254.000.

Fang, Sheng; and Lee, Sam H., to Advanced Micro Devices, Inc. Selectable multi-input CMOS data register. 4,692,634, Cl. 307-272.100.

Fanuc Ltd.: *See*—
Kishi, Hajimu; and Tanaka, Kunio, 4,692,873, Cl. 364-474.000.
Komiya, Hidetsugu, 4,692,856, Cl. 364-167.000.

Fanuc LTD: *See*—
Kiya, Nobuyuki, 4,692,872, Cl. 364-474.000.

Farago, Zoltan; and Buschulte, Winfried, to Deutsche Forschungs- und Versuch-Sanstalt fur Luft- und Raumfahrt E.V. Method for desulfurizing flue gas in fuel oil firing systems. 4,692,319, Cl. 423-242.000.

Farfan de los Godos, Henry F., to 102160 Canada Inc. Lumbar spinal brace. 4,691,696, Cl. 128-78.000.

Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., to General Motors Corporation. Steering column with selectively adjustable and preset preferred positions. 4,691,587, Cl. 74-493.000.

Farrell, Roberta L., to Repligen Corporation. Use of rLDM TM 1–6 and other ligninolytic enzymes for the decolorization of El effluent. 4,692,413, Cl. 435-278.000.

Fawcett, Bradley W.; and Sendelbach, Lee A., to International Business Machines Corporation. Legibility enhancement for alphanumeric displays. 4,692,758, Cl. 340-735.000.

FBC Limited: *See*—
West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., 4,692,457, Cl. 514-361.000.

Fedi, Mauro: *See*—
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,692,525, Cl. 544-360.000.

Feinstein, David Y. Electronic card for sharing the same edgeboard connector with another electronic edgeboard. 4,692,120, Cl. 439-62.000.

Feldhacker, Marvin E.: *See*—
Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., 4,692,877, Cl. 364-514.000.

Feldman, Louis W.; and Yawn, David H., to Cardiovascular Systems Inc. Centrifuge. 4,692,136, Cl. 494-38.000.

Fenster, Paul: *See*—
Shimoni, Yair; Fenster, Paul; and Nissenson, Bilha, 4,692,864, Cl. 364-414.000.

Fensterer, Howard F.: *See*—
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.

Ferbrache, Raymond B., to Gott Corporation. Lid locking handle for waste container. 4,691,840, Cl. 220-318.000.

Ferdinand Bernhard Schmetz, Firma: *See*—
Schmetz, Peter-Nikolaus; and Klocker, Peter, 4,691,825, Cl. 206-380.000.

Ferguson, George R., to Duff Norton Company. Articulable siphon tube assembly for dryer drum. 4,691,452, Cl. 34-119.000.

Ferm, Joyce E.: *See*—
Torgerson, Gary D.; and Ferm, Joyce E., 4,691,409, Cl. 16-250.000.

Ferm & Torgerson Partnership: *See*—
Torgerson, Gary D.; and Ferm, Joyce E., 4,691,409, Cl. 16-250.000.

Fernbach, James L. Fishing weight assembly. 4,691,468, Cl. 43-44.900.

Ferranti plc: *See*—
Pitches, Brian E.; and Wright, David A., 4,691,446, Cl. 33-516.000.

Ferrari, Lorenzo: *See*—
Cavigli, Mario; and Ferrari, Lorenzo, 4,692,929, Cl. 373-89.000.

Ferrofluidics Corporation: *See*—
Raj, Kuldip; and Casciari, Raoul, 4,692,826, Cl. 360-97.000.

Fiat Auto S.p.A.: *See*—
Sburlati, Luigi; Acuto, Giovanni; and Stacchino, Giuseppe, 4,691,946, Cl. 248-429.000.

Ficker, Harold K.; and Teskin, Frederick M., to El Paso Products Company. Polypropylene compositions of improved clarity. 4,692,489, Cl. 524-243.000.

Fiedziuszko, Slawomir J.; and Ziegler, Craig A., to Ford Aerospace & Communications Corporation. Narrow bandpass dielectric resonator filter with mode suppression pins. 4,692,723, Cl. 333-202.000.

Field Group Chemicals Pty. Ltd.: *See*—
Kritzler, Steven, 4,692,325, Cl. 424-4.000.

Field, Jasper H.: *See*—
Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., 4,692,212, Cl. 162-206.000.

Fields, Loranza D., Jr. Horizontal evaluation datum scope. 4,691,445, Cl. 33-367.000.

Fildan, Gerhard. Bolt assembly for a door set. 4,691,951, Cl. 292-337.000.

Filhol, Stuart J. Dental pin and holder. 4,692,116, Cl. 433-225.000.

Fillet, Pierre R., to Vallourec. Knurled drill stem. 4,691,791, Cl. 175-320.000.

Filomeno, Vito G., to Warner-Lambert Company. Skin bleaching detergent bar. 4,692,261, Cl. 252-105.000.

Findlay, Hugh T., to International Business Machines Corporation. Transfer element and process for radiation defined images. 4,692,395, Cl. 430-254.000.

Fink, Hans-Ferdi: *See*—
Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, 4,692,267, Cl. 252-321.000.

Fink, Werner; and Bohn, Heinz, to ITT Industries, Inc. Liquid ring vacuum pump arrangement having minimized operating liquid consumption. 4,692,101, Cl. 417-68.000.

Firey, Joseph C. Solid with gas reactor plant. 4,692,171, Cl. 48-61.000.

First Byte: *See*—
Jacks, Richard P.; and Sprague, Richard P., 4,692,941, Cl. 381-52.000.

Fischer, Francois: *See*—
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, 4,691,535, Cl. 66-144.000.

Fischer, Helmut. Device for measuring the properties of solid materials which can be derived from the behavior of a penetrating body. 4,691,559, Cl. 73-81.000.

Fischer & Porter Company: *See*—
Herzl, Peter J., 4,691,578, Cl. 73-861.380.

Fischle, Martin: *See*—
Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, 4,692,570, Cl. 200-4.000.

Fisher, Alfred J., III; and Schmidt, Timothy J., to General Safety Corporation. Method of molding an integral spur gear and toothed sprocket assembly. 4,692,294, Cl. 264-259.000.

Fisher Controls International, Inc.: *See*—
Varnum, Gerald F.; and Duke, Christopher C., 4,691,573, Cl. 73-702.000.

Fisher, William B.: *See*—
James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., 4,692,321, Cl. 423-404.000.

Fitzpatrick, Brian J., to North American Philips Corporation. Magnetic application of light-absorbing particles to a lenticular screen. 4,692,359, Cl. 427-45.100.

Fix, Joseph A.: *See*—
Alexander, Jose; Repta, A. J.; and Fix, Joseph A., 4,692,441, Cl. 514-194.000.

Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., to Baltimore Aircoil Company, Inc. Compression sealing of tubes within shell and tube heat exchanger. 4,691,769, Cl. 165-158.000.

Fleming, William T.: *See*—
Lalin, Hill S.; Bermudez, Jorge E.; and Fleming, William T., 4,691,577, Cl. 73-861.050.

Floran, Robert J.: *See*—
Ebenhack, Ben W.; and Floran, Robert J., 4,691,772, Cl. 166-254.000.

Florio, Steven M.: *See*—
Bernard, Walter J.; and Florio, Steven M., 4,692,224, Cl. 204-56.100.

Flowdril Corporation: *See*—
Reichman, James M.; McDonald, Michael C.; and O'Brien, T. B., 4,691,790, Cl. 175-67.000.

FMC Corporation: *See*—
Chang, Jun H., 4,692,182, Cl. 71-88.000.

Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, to TH. Goldschmidt AG. Use of polymers of alkylvinyl ethers to prevent or eliminate foam on aqueous media. 4,692,267, Cl. 252-321.000.

Folkmar, Jan: *See*—
Hofmann, Raimund, 4,691,821, Cl. 206-216.000.

Fondation Suisse pour la Recherche en Microtechnique: *See*—
Genequand, Pierre, 4,692,016, Cl. 355-1.000.

Fonderie Musil: *See*—
Biboliet, Bernard, 4,692,097, Cl. 416-207.000.

Ford Aerospace & Communications Corporation: *See*—
Chism, Samuel B., Jr., 4,692,808, Cl. 358-231.000.
Fiedziuszko, Slawomir J.; and Ziegler, Craig A., 4,692,723, Cl. 333-202.000.

Ford, John M. B.; and Moore, David G., to Realex Corporation. Pasty product dispenser having combination actuator and outlet valve. 4,691,847, Cl. 222-259.000.

Ford, Michael B. Hose quick coupling apparatus. 4,691,942, Cl. 285-84.000.

Ford Motor Company: *See*—
Beckwith, Elaine C., 4,692,320, Cl. 423-263.000.

Ford, Roger S.: *See*—
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.

Fornasari, Paolo, to Eltek S.p.A. Thermally-activated device for creating considerable power. 4,691,516, Cl. 60-527.000.

Forrester, Gilbert. Method and apparatus for measuring the distribution of fiber widths and adjusting the refining of fibrous stock. 4,692,210, Cl. 162-49.000.

Forschirm, Alex: *See*—
Dotson, Duane L.; and Forschirm, Alex, 4,692,168, Cl. 44-7.100.

Forseth, Glenn J.: *See*—
Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., 4,692,312, Cl. 422-151.000.

Forsyth Dental Infirmary for Children: *See*—
Jordan, Harold V.; and Marmel, Max, 4,692,407, Cl. 435-36.000.

Forsyth, James M., to Hampshire Instruments. X-ray lithography system. 4,692,934, Cl. 378-34.000.

Fort, Edward S., to Fort Vale Engineering Ltd. Valve seals. 4,691,734, Cl. 137-493.400.

Fort Vale Engineering Ltd.: *See*—
Fort, Edward S., 4,691,734, Cl. 137-493.400.

Fosbinder, Larry L.: *See*—
Trumbauer, David V.; Fosbinder, Larry L.; and Erion, Terry L., 4,691,754, Cl. 164-9.000.

Fosslien, Egil, to Fosslien, Egil. Fluid sampling apparatus. 4,691,580, Cl. 73-864.840.

Foures, Jacques. Process apparatus and system for preserving and dispensing wine. 4,691,842, Cl. 222-1.000.

Foxx, Mary E.: *See*—
Klein, Robert W.; and Foxx, Mary E., 4,692,329, Cl. 424-81.000.

Framatome & Cie.: *See*—
Grespin, Gerard, 4,692,300, Cl. 376-245.000.

Frank, Arthur M., to Grumman Aerospace Corporation. Torsion spring powered missile wing deployment system. 4,691,880, Cl. 244-49.000.

Frank, Harry, to Shell Oil Company. Deactivation of phosphonium salt catalyst. 4,692,504, Cl. 528-89.000.

Frank, Werner, to Licentia Patent-Verwaltungs-GmbH. Separating apparatus for flat objects. 4,691,913, Cl. 271-34.000.

Frantz, Virgil L., to Roanoke College. Two-stage precoalescer unit. 4,692,175, Cl. 55-218.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,691,565, Cl. 73-146.000.

Frazer, Robert E.: *See*—
Adachi, Iwao P.; Adachi, Yoshifumi; and Frazer, Robert E., 4,692,003, Cl. 351-212.000.

Frede, Dieter, to Condor-Werk Gebr. Frede GmbH & Co. KG. Float switch using foam body for floatability. 4,692,576, Cl. 200-84.00R.

Freed, Paul S.: *See*—
Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.

Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, to Dana-Farber Cancer Institute, Inc. Monoclonal antibodies to antigen on activated human B-cells and assay therefor, protein antigenic determinant therefor and method of making same. 4,692,405, Cl. 435-7.000.

Frega, John: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Fremaux, Jacques: *See*—
Villain, Jean-Marie; and Fremaux, Jacques, 4,692,180, Cl. 65-32.000.

Frerich, Josef, to Deere & Company. Housing for holding a supply roll of large round bale wrap material. 4,691,503, Cl. 53-587.000.

Fresnius AG: *See*—
Emde, Carsten, 4,692,152, Cl. 604-164.000.

Fried, Krupp GmbH: *See*—
Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,692,218, Cl. 203-19.000.
Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, 4,692,930, Cl. 373-72.000.

Friedman, Gerald, to TRW Inc. Method of shaping a workpiece. 4,691,857, Cl. 228-265.000.

Friedman, Robert H., to Texaco Inc. Method of recovering hydrocarbon from oil shale. 4,692,239, Cl. 208-430.000.

Frisillo, Albert L.: *See*—
Sondergeld, Carl H.; Frisillo, Albert L.; and Norris, Janice O., 4,692,910, Cl. 367-75.000.

Fritsche, Joel L.: *See*—
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Fritz, William O.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Fromm, George R.; and Stefaniak, Philip S., to Helene Curtis, Inc. Pilot light arrangement for styling iron with swivel cord. 4,692,586, Cl. 219-225.000.

Frontier, Inc.: *See*—
Ellingson, Hartley, 4,691,957, Cl. 296-98.000.

Fruhaufova, Maria: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Frush, Donald R., to CTB, Inc. Rail lock device for tubular fence. 4,691,897, Cl. 256-65.000.

Frydman, Georges. Frame structure especially for a cabinet, e.g. of the shelved type. 4,691,644, Cl. 108-111.000.

FSI Corporation: *See*—
Silvernail, James M.; and Miller, Clifford C., 4,691,722, Cl. 134-155.000.

Fsk Co., Ltd.: *See*—
Asano, Shinzo, 4,691,630, Cl. 101-212.000.

Fuchigami, Wataru; and Nakayama, Yoshiharu, to Yamaha Motor Co., Ltd. Timing chain drive. 4,692,129, Cl. 474-148.000.

Fudge, Kent D., to Atlantic Richfield Company. Expandable polypropylene interpolymer particles. 4,692,471, Cl. 521-59.000.

Fuji Electric Company, Ltd.: *See*—
Hirota, Toshio, 4,692,391, Cl. 429-34.000.
Taniguchi, Harutaka; and Fumoto, Takafumi, 4,692,622, Cl. 250-343.000.

Fuji Electric Corporate Research and Devel., Ltd.: *See*—
Nishiura, Masaharu; and Haruki, Hiromu, 4,692,345, Cl. 427-39.000.

Fuji Electric Corporate Research & Development Co., Ltd.: *See*—
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, 4,692,782, Cl. 357-29.000.

Fuji Electric Corporate Research and Development Ltd.: *See*—
Taniguchi, Harutaka; and Fumoto, Takafumi, 4,692,622, Cl. 250-343.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Nagai, Masaaki, 4,691,678, Cl. 123-425.000.

Fuji Kogyo Kabushiki Kaisha: *See*—
Nakajima, Junichi, 4,691,750, Cl. 144-208.00B.

Fuji Machinery Company, Ltd.: *See*—
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,691,499, Cl. 53-451.000.

Fuji Photo Film Co., Ltd.: *See*—
Cho, Michio, 4,691,996, Cl. 350-465.000.
Matsumoto, Fumio, 4,692,797, Cl. 358-76.000.
Suzuki, Kenji, 4,692,794, Cl. 358-44.000.

Fuji Photo Optical Company, Ltd.: *See*—
Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, 4,692,608, Cl. 250-216.000.

Fujibayashi, Kazuo: *See*—
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.

Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Dual audio track recording system in which one track also contains a control signal. 4,692,818, Cl. 360-22.000.

Fujii, Hidehiko: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.

Fujimori Kogyo Co., Inc.: *See*—
Takahashi, Toru; and Yoshida, Taro, 4,692,327, Cl. 428-35.000.

Fujinami, Minpei: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Fujinawa, Hirotaka: *See*—
Sakuma, Shuji; and Fujinawa, Hirotaka, 4,691,718, Cl. 132-84.00R.

Fujino, Akihiko: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.

Fujioka, Masanobu, to Kokusai Denshin Denwa Co., Ltd. Packet switching system. 4,692,917, Cl. 370-60.000.

Fujirebio Kabushiki Kaisha: *See*—
Ashihara, Yoshihiro; and Kasahara, Yasushi, 4,692,404, Cl. 435-5.000.

Fujisawa, Kyohei: *See*—
Yamada, Mitsuhiko; Fujisawa, Kyohei; and Kitamura, Hideaki, 4,692,796, Cl. 358-76.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, 4,692,444, Cl. 514-406.000.

Fujishima, Kazuyasu: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.

Fujita, Akihiro: *See*—
Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, 4,692,012, Cl. 354-403.000.

Fujita, Masahiro; and Uemura, Yukio, to Maeda Metal Industries Ltd.; and Nissan Motor Co., Ltd. Bolt-nut tightening device having means for preventing abnormal rotation. 4,691,786, Cl. 173-12.000.

Fujita, Shigeto: *See*—
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.

Fujitsu Limited: *See*—
Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, 4,692,843, Cl. 361-414.000.
Monma, Hideo; Ishiguro, Masato; and Kawano, Tetsuo, 4,692,783, Cl. 357-42.000.
Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, 4,692,900, Cl. 365-63.000.
Sato, Takuso; and Ichida, Nobuyuki, 4,691,569, Cl. 73-596.000.
Takemae, Yoshihiro, 4,692,689, Cl. 323-313.000.
Yagi, Harumi, 4,691,855, Cl. 228-4.500.

Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Sutoh, Junichi, to TDK Corporation. High dielectric porcelain composition and method of reducing sintering temperature thereof. 4,692,422, Cl. 501-136.000.

Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, to OKI Electronics Co., Ltd. Dielectric filter having trimmable capacitor. 4,692,725, Cl. 333-203.000.

Fukazawa, Tokuumi: *See*—
Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, 4,691,983, Cl. 350-96.120.

Fukuda, Moritoshi: *See*—
Nakayama, Hiromichi; and Fukuda, Moritoshi, 4,691,416, Cl. 24-90.00B.

Fukui, Hiroshi: *See*—
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.

Fukui, Ryoichi; and Minamikawa, Susumu, to Omron Tateisi Electronics Co. Electronic thermometer. 4,692,034, Cl. 374-208.000.

Fukunaga, Masami; and Yamaguchi, Tomoyoshi, to Dai-Ichi Seiko Kabushiki Kaisha. Integrated circuit tester socket. 4,691,975, Cl. 439-266.000.

Fukunaga, Masao; and Nonoguchi, Hiroshi, to Matsushita Electric Industrial Co. Electric food processor. 4,691,870, Cl. 241-36.000.

Fukushima, Aritoshi: *See*—
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.

Fukushima, Kazumasa: *See*—
Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, 4,692,043, Cl. 400-124.000.

Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Interlock push-push switch device. 4,692,573, Cl. 200-50.00C.

Fukuzawa, Soichi: *See*—
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.

Fukuzo, Yukio; and Inoue, Yasukazu, to NEC Corporation. Active pull-up circuit controlled by a single pull-up clock signal. 4,692,642, Cl. 307-530.000.

Fumoto, Takafumi: *See*—
Taniguchi, Harutaka; and Fumoto, Takafumi, 4,692,622, Cl. 250-343.000.

Funakoshi, Satoshi: *See*—
Uemura, Yahiro; and Funakoshi, Satoshi, 4,692,331, Cl. 424-85.000.

Funamoto, Takao: *See*—
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Fyrnetics, Inc.: *See*—
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.

G. D. Searle & Co.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,692,552, Cl. 562-475.000.

G.O.R. Applicazioni Speciali S.p.A.: *See*—
Cesano, Franco, 4,692,108, Cl. 425-292.000.

G. R. Potts Associates, Inc.: *See*—
Potts, Gerald R.; and Ryder, John C., 4,691,564, Cl. 73-146.000.

Gabori, Andor: *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Gabus, Georges A.: *See*—
Mock, Elmar; and Gabus, Georges A., 4,692,033, Cl. 368-280.000.

GAF Corporation: *See*—
Liu, Kou-Chang, 4,692,551, Cl. 562-471.000.

Galani, Zvi, to Raytheon Company. Single resonator push-push oscillator. 4,692,714, Cl. 331-1.00R.

Galer, David G.: *See*—
Cordell, Henry L.; and Galer, David G., 4,691,846, Cl. 222-198.000.

Galerne, Jean, to LTM Corporation of America. Adjustable light projector. 4,692,844, Cl. 362-3.000.

Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., to Cameron Iron Works, Inc. Subsea wellhead structure. 4,691,780, Cl. 166-348.000.

Gandolfi, Carmelo A.: *See*—
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Gandy, James, to Signtech Inc. Illuminated awning assembly. 4,692,847, Cl. 362-152.000.

Gannis, Peter M.; Wilkins, Howard; and Holloway, Oris E., Jr., to Nabisco Brands, Inc. Process for honey-roasting nuts. 4,692,342, Cl. 426-293.000.

Gano, John C., to Otis Engineering Corporation. Well drilling and completion apparatus. 4,691,781, Cl. 166-368.000.

Ganz, Robert H.: *See*—
Johnson, Roy A.; and Ganz, Robert H., 4,691,606, Cl. 83-175.000.

Ganz, Ulrich W.; and Topness, Paul C., to Boeing Company, The. Inflow control device for engine testing. 4,691,561, Cl. 73-117.100.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Stenzel, Gerhard; and Kaule, Wittich, 4,691,940, Cl. 283-70.000.

Garcia, Raoul; Michaux, Daniel; and Sales, Andre , to SCP Biscornet. Ultrasonic device. 4,691,724, Cl. 134-169.00R.

Gard, Michael F.; Warmack, Ralph E.; Lee, Kyong H.; and Maschhoff, Robert H., to Amoco Corporation. Adaptive seismic signal processor. 4,692,909, Cl. 367-45.000.

Gardlik, John M.: *See*—
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.

Garff, Jeffrey L. Faucet handle arrangement. 4,691,895, Cl. 251-292.000.

Garnier, Jean-Francois: *See*—
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, 4,692,862. Cl. 364-200.000.

Garrett Corporation, The: *See*—
Safarik, William F., 4,692,093, Cl. 416-1.000.

Gartner, Helmut: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Gates, Duncan A.: *See*—
West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., 4,692,457, Cl. 514-361.000.

Gaul, Hartmut; Mickal, Hermann; and Haboeck, Adolf, to Siemens Aktiengesellschaft. Procedure and apparatus for uninterruptible power supply. 4,692,632, Cl. 307-66.000.

Gaur, Santosh P.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.

Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, to Hoechst Aktiengesellschaft. Process and apparatus for continuous determination of the states of anisotropy of optically active materials. 4,692,026, Cl. 356-345.000.

Geary, David F.: *See*—
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.

Gebr. Eickhoff Maschinenfabrik and Eisengiesserei m.b.H.: *See*—
Schupphaus, Herbert, 4,691,967, Cl. 299-1.000.

Gebr. Hofmann GmbH & Co. KG. Maschinenfabrik: *See*—
Himmler, Gunther; and Knoll, Gunter, 4,691,567, Cl. 73-483.000.

Gebruder Junghans GmbH: *See*—
Winterhalter, Walter; and Halsig, Andreas, 4,691,635, Cl. 102-251.000.

Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck" : *See*—
Reuter, Alfred, 4,691,749, Cl. 144-39.000.

GEC Avionics Limited: *See*—
Ellis, Stafford M., 4,692,840, Cl. 361-393.000.

Gegan, Michael J., to United States of America, Navy. Dual band slotted microstrip antenna. 4,692,769, Cl. 343-700.0MS.

Gelderloos, Pouwel J., to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek. Method of operating an absorption heat pump or refrigerator, and an absorption heat pump or refrigerator. 4,691,525, Cl. 62-101.000.

Gelfand, Peter C.; Piulle, Walter V.; and Rettenmaier, Louis F. Ionizer assembly having a bell-mouth outlet. 4,692,174, Cl. 55-129.000.

Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., to Acushnet Company. Process for curing a polymer and product thereof. 4,692,497, Cl. 525-263.000.

Gendron, Kevin: *See*—
Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., 4,691,780, Cl. 166-348.000.

Genequand, Pierre, to Fondation Suisse pour la Recherche en Microtechnique. Process for electrophotographic matrix printing and device for carrying out the process. 4,692,016, Cl. 355-1.000.

General Connectors Corporation: *See*—
Affa, Steven N.; Newman, Ira R.; and Allison, Robert S., 4,691,741, Cl. 138-113.000.

General DataComm., Inc.: *See*—
Jordan, Paul A., 4,692,639, Cl. 307-449.000.

General Electric Company: *See*—
Abolins, Visvaldis, 4,692,490, Cl. 524-371.000.
Hayes, Cecil E., 4,692,705, Cl. 324-318.000.
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,692,644, Cl. 310-178.000.
Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, 4,692,880, Cl. 364-521.000.
Payne, Thomas R., 4,692,596, Cl. 219-450.000.
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,691,433, Cl. 437-44.000.
Roy, Prodyot, 4,692,390, Cl. 429-17.000.
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,692,499, Cl. 525-524.000.

General Engineering Radcliffe Limited: *See*—
Casey, Frank, 4,692,233, Cl. 204-298.000.

General Motors Corporation: *See*—
Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., 4,691,587, Cl. 74-493.000.
Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., 4,692,098, Cl. 416-223.00R.
Schaeffer, Eric S., 4,692,684, Cl. 322-90.000.

General Safety Corporation: *See*—
Fisher, Alfred J., III; and Schmidt, Timothy J., 4,692,294, Cl. 264-259.000.

Georges, Jean-Pierre: *See*—
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, 4,692,862, Cl. 364-200.000.

Georgia Tech Research Corporation: *See*—
Tedder, Daniel W., 4,692,432, Cl. 568-916.000.

Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. Adamantane-spirolactams. 4,692,515, Cl. 540-203.000.

Georgiou, George E.; and Poli, Gary N., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Selective electroless plating of vias in VLSI devices. 4,692,349, Cl. 437-230.000.

Geosource, Inc.: *See*—
Mueller, Allan H.; Perkins, Dean P.; and Evans, Rhys M., 4,692,912, Cl. 367-190.000.

Gerard, Jean-Louis: *See*—
Le Marchand, Claude; and Gerard, Jean-Louis, 4,691,809, Cl. 188-71.900.

Gerhards, Klaus: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Geringer, Miles S.; and Kaufman, Vernan R., to Tecumseh Products Company. Connecting rod design with voids. 4,691,590, Cl. 74-579.00E.

Gero, Ilona B. Unit package containing ready-to-use vaginal contraceptive. 4,692,143, Cl. 604-55.000.

Getz, John L., to Industrial Adhesives, Inc. Means for applying liquid to roller in line applicator. 4,692,202, Cl. 156-554.000.

Gezari, Daniel Y.: *See*—
Boyd, Robert L.; Krukowski, Richard; and Gezari, Daniel Y., 4,691,694, Cl. 128-25.00R.

Ghose, Rabindra N. Separation of specific biological cells by a biochemical filter. 4,692,411, Cl. 435-243.000.

Ghrist, William D., III: *See*—
Crew, Albert W.; Ghrist, William D., III; and Remley, Gilbert W., 4,692,299, Cl. 376-216.000.

Gianese, Goffredo, to Sasib S.p.A. Device for feeding cigarettes or the like rod-like articles. 4,691,848, Cl. 222-269.000.

Giannini, Mario: *See*—
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,692,525, Cl. 544-360.000.

Gilbert, David S., to Howard, William H. Guitar stand with fold-away, substantially concealable legs. 4,691,610, Cl. 84-327.000.

Gildenblat, Gennady: *See*—
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,691,433, Cl. 437-44.000.

Gillery, F. Howard; and Criss, Russell C., to PPG Industries, Inc. Stainless steel overcoat for sputtered films. 4,692,389, Cl. 428-622.000.

Gilley, J. Kyle: *See*—
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.

Gillilan, James. Rotary power transducer system. 4,691,513, Cl. 60-495.000.

Gillman, Hyman D.: *See*—
Larson, Harold V.; and Gillman, Hyman D., 4,692,535, Cl. 549-542.000.

Gillmann, Hanno, to Licentia Patent-Verwaltungs-GmbH. Device for separating flat objects. 4,691,912, Cl. 271-10.000.

Gilmour, Alfred J., to Auto-Flush Systems Ltd. Improved filler tube tip and centering bell bushing. 4,691,748, Cl. 141-165.000.

Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, to Societe Francaise Hoechst. Process to manufacture glyoxylic acid by electrochemical reduction of oxalic acid. 4,692,226, Cl. 204-73.00R.

Gioia, G. Leonard. High performance amphibious airplane. 4,691,881, Cl. 244-106.000.

Giorgis, Roberto. Hair dryer. 4,691,451, Cl. 34-68.000.

Gist-Brocades N.V.: *See*—
Apontoweil, Peter; and Krasselt, Mansfred M., 4,692,410, Cl. 435-235.000.

Gjertsen, Robert K., to Westinghouse Electric Corp. Removable and reusable locking pin for top nozzle assembly and disassembly. 4,692,304, Cl. 376-446.000.

Glaberson, John: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Glaser, Dieter; and Klemm, Theobald, to VEB Kombinat Textima. Method and apparatus for the removal of liquid from a running yarn. 4,691,450, Cl. 34-23.000.

Glunk, Josef, to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr. Rotary mower for a tractor. 4,691,504, Cl. 56-192.000.

Godfrin, Jean-Philippe; Landrevie, Bernard; and Escache, Gerard, to Societe Nationale des Poudres et Explosifs. Igniter intended for gas-generating charges in shells. 4,691,633, Cl. 102-202.000.

Godo Steel, Ltd.: *See*—
Takai, Kiyoshi; and Iwasaki, Kiyoshi, 4,692,113, Cl. 432-72.000.

Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., to Sandoz Ltd. Inhibiting polymerization of ethylenically unsaturated monomers. 4,692,544, Cl. 560-4.000.

Goff, Ralph D.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Gogami, Takatoshi: *See*—
Saitoh, Michihiro; Gogami, Takatoshi; and Osada, Toshiyuki, 4,692,799, Cl. 358-106.000.

Gogol, Carl A., to Inficon Leybold-Heraeus. Wavelength specific detection system for measuring the partial pressure of a gas excited by an electron beam. 4,692,630, Cl. 250-573.000.

Goldstar Co., Ltd.: *See*—
Gwon, Seong T., 4,692,823, Cl. 360-85.000.

Gonen, Amos: *See*—
Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.

Gooden, Richmond A., to United Aircraft Products, Inc. Bootstrap reservoir. 4,691,739, Cl. 138-31.000.

Goodnow, Ronald F.; and Reid, Robert A., to Thermo Electron-Web Systems, Inc. Doctoring apparatus. 4,691,406, Cl. 15-256.530.

Goodsmith, Dale H., to Multifastener Corporation. Quick disconnect coupler. 4,691,429, Cl. 29-432.000.

Goodwin, Allen W. Acoustic energy, real-time spectrum analyzer. 4,692,117, Cl. 434-185.000.

Goodwin, Graham C.: *See*—
Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., 4,691,547, Cl. 72-16.000.

Gordon, Eric M., to E. R. Squibb & Sons, Inc. Certain acyclic, alicyclic, aromatic or heterocyclic derivatives of 3-benzoylamino-2-oxobutyl-amino-carbonyl-oxy-3-propanoic acids, esters thereof, pharmaceutical compositions containing same and their enkephalinase inhibiting properties. 4,692,455, Cl. 514-332.000.

Gordon, Harry W., to Schmid Laboratories. Method for treating hypercholesterolemia with cryptocidin. 4,692,334, Cl. 424-122.000.

Gordon, Herman B., to Rogers Corporation. Solderless connection apparatus. 4,691,972, Cl. 439-77.000.

Gordon, Ronald O.: *See*—
Singery, Denis C.; and Gordon, Ronald O., 4,692,154, Cl. 604-172.000.

Gorelick, Donald E.: *See*—
Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., 4,691,987, Cl. 350-96.230.

Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., to Ciba-Geigy Corporation. 6-substituted penem compounds. 4,692,442, Cl. 514-195.000.

Gosteli, Jacques: *See*—
Tenud, Leander; and Gosteli, Jacques, 4,692,543, Cl. 558-342.000.

Goswami, Jagadish C.; and Aurichio, Joseph A., to Stauffer Chemical Company. Thermally stable adhesive comprising soluble polyimide resin and epoxy resin. 4,692,272, Cl. 252-514.000.

Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Rotating electric motor with reduced cogging torque. 4,692,645, Cl. 310-184.000.

Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Rotating electric motor with reduced cogging torque. 4,692,646, Cl. 310-184.000.

Gott Corporation: *See—*
Ferbrache, Raymond B., 4,691,840, Cl. 220-318.000.

Gottfried, Achberger, to Zahnradfabrik Friedrichshafen AG. Gear shift device. 4,691,585, Cl. 74-473.00R.

Goudreau, Noel: *See—*
Arensdorf, Stephen C.; Stromgren, Lawrence T.; and Goudreau, Noel, 4,691,697, Cl. 128-80.00L.

Gouilloud, Michel: *See—*
Locke, Stanley; and Gouilloud, Michel, 4,692,707, Cl. 324-374.000.

Goulay, Jean: *See—*
Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, 4,692,435, Cl. 514-56.000.

Goushi, Sei'ichi: *See—*
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.

Gover, Gary W. Band security lock. 4,691,539, Cl. 70-18.000.

Governale, Bernard C., to Peachtree Doors, Inc. Rigidifying system for window assembly during its shipment and installation. 4,691,477, Cl. 49-380.000.

Grabowski, Robert; and Kramer, Walter, to Reifenhauser GmbH & Co. Maschinenfabrik. Apparatus for stretching the individual strands of a bundle of fibers or threads. 4,692,106, Cl. 425-66.000.

Grace, Mary D.: *See—*
Grace, Ronald; and Grace, Mary D., 4,691,827, Cl. 206-465.000.

Grace, Ronald; and Grace, Mary D. Supported package attached to panel in parallel slots. 4,691,827, Cl. 206-465.000.

Graco Inc.: *See—*
Krohn, Duane D.; and Boogerman, Allan, 4,692,048, Cl. 401-197.000.

Gradco Systems, Inc.: *See—*
Lawrence, Frederick J., 4,691,914, Cl. 271-297.000.

Gradowski, Steven: *See—*
Hyner, Jacob; and Gradowski, Steven, 4,692,080, Cl. 411-387.000.

Graham, Paul W. L.: *See—*
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

Graham, Thomas; Perrins, Leslie A.; and Morris, Kevin, to Reed International plc. Paint containers. 4,691,838, Cl. 220-93.000.

Grandi, Maria: *See—*
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Grant, Duane E.: *See—*
Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., 4,692,877, Cl. 364-514.000.

Grantz, Helmut; and Odebrecht, Wolfgang, to Daimler-Benz Aktiengesellschaft. Lock arrangement for a motor vehicle door. 4,691,949, Cl. 292-216.000.

Gray, Joel E., to Mayo Medical Resources. Slice thickness and contiguity phantom for a magnetic resonance imaging scanner. 4,692,704, Cl. 324-318.000.

Gray, John D., to Ex-Cell-O Corporation. Mold method for multi-color plastic shells. 4,692,293, Cl. 264-245.000.

Gray, Reed A.; and Joo, Grant K., to Stauffer Chemical Co. S-n-butyl-N,N-diisopropyl thiocarbamate as a selective herbicide in sugarbeets, carrots and cabbage. 4,692,186, Cl. 71-100.000.

Greaves, Brian; and Ingham, Paul, to Dearborn Chemicals Limited. Method of inhibiting corrosion in aqueous systems. 4,692,315, Cl. 422-18.000.

Greaves, Brian; and Grenside, Stuart J., to Dearborn Chemicals Limited. Method of inhibiting corrosion in aqueous systems. 4,692,316, Cl. 422-16.000.

Greaves, Brian, to W. R. Grace & Co. Corrosion control in aqueous systems using cationic polymers in combination with phosphonohydroxyacetic acid. 4,692,317, Cl. 422-15.000.

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Uemura, Yahiro; and Funakoshi, Satoshi, 4,692,331, Cl. 424-85.000.

Green, Steven R.; De Muro, David M.; and Sokola, Raymond L., to Motorola, Inc. Multiple resonator dielectric filter. 4,692,726, Cl. 333-206.000.

Greene, Richard K.: *See—*
Boldt, Clifford R.; and Greene, Richard K., 4,692,505, Cl. 528-241.000.

Greene, Vibert F. Jet airplane. 4,691,879, Cl. 244-45.00R.

Greeves, Godfrey, to Lucas Industries public limited company. Fuel injection nozzles. 4,691,864, Cl. 239-453.000.

Gregg, Ralph C., Jr., to Motorola, Inc. Binaural Doppler radar target detector. 4,692,763, Cl. 342-28.000.

Greisner, Paul: *See—*
Mayer, Siegfried; and Greisner, Paul, 4,691,950, Cl. 292-269.000.

Grenside, Stuart J.: *See—*
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Grespin, Gerard, to Framatome & Cie. Device for the underwater measurement of the hardness of a vertical wall of the partitioning of the core of a pressurized water nuclear reactor. 4,692,300, Cl. 376-245.000.

Gresser, Robert, to Rhone-Poulenc Chimie de Base. Stable, pumpable aqueous zeolite suspensions. 4,692,264, Cl. 252-140.000.

Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, to Marketing Displays, Inc. Sign and sign stand. 4,691,892, Cl. 248-624.000.

Groezinger, John J.: *See—*
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Grooms, John M.; and Jones, Mark A., to Burton Mechanical Contractors, Inc. Vacuum sewerage system with in pit breather. 4,691,731, Cl. 137-205.000.

Gross, James R.: *See—*
Cianci, James P.; and Gross, James R., 4,692,150, Cl. 604-111.000.

Grumman Aerospace Corporation: *See—*
Frank, Arthur M., 4,691,880, Cl. 244-49.000.
Szuchy, Nicholas C., 4,692,610, Cl. 250-227.000.

Grunwald, Werner; and Schmid, Kurt, to Robert Bosch GmbH. Spark plug for an otto-type internal combustion engine. 4,692,657, Cl. 313-130.000.

Gruppo Lepetit S.p.A.: *See—*
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.

Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, to Institut fur Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee. Procedure for the production of a granulated infant milk food product. 4,692,340, Cl. 426-72.000.

GTE Communication Systems Corporation: *See—*
Bray, Bernard D., 4,692,696, Cl. 324-158.00R.
Bray, Bernard D., 4,692,697, Cl. 324-158.00R.
Crabbe, Edwin P., Jr., 4,692,897, Cl. 364-900.000.

GTE Laboratories Incorporated: *See—*
Bencuya, Izak; and Cogan, Adrian I., 4,692,780, Cl. 357-22.000.

GTE Products Corporation: *See—*
Moskowitz, Philip E.; and Maya, Jekob, 4,692,661, Cl. 313-485.000.
Poyner, John C., 4,692,656, Cl. 313-113.000.
Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., 4,691,985, Cl. 350-96.180.

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Gunesin, Binnur Z., to Mobil Oil Corporation. Non-staining, non-sticking styrenic polymers. 4,692,492, Cl. 524-731.000.

Gupta, Alankar; and Lloyd, Adam J. P., to Boeing Company, The. Cooling and visor defogging system for an aircraft pilot and crew. 4,691,760, Cl. 165-26.000.

Gupta, Mani R.: *See—*
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.

Gurt, Sven A.: *See—*
Blomberg, Peter E.; and Gurt, Sven A., 4,691,529, Cl. 62-332.000.

Gutschmit, Alan. Strand storing and delivering device. 4,691,873, Cl. 242-47.010.

Gwon, Seong T., to Goldstar Co., Ltd. Tape loading device for a video tape recorder. 4,692,823, Cl. 360-85.000.

Gwyn, John E.: *See—*
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Gwynne, Jacob M. Metal framing system. 4,691,494, Cl. 52-729.000.

Gyorgy, Makara, to Innovator Mernok Kisszovetkezet. Process for rearing and transporting arrangements of epiphytic plants. 4,691,472, Cl. 47-58.000.

Haar, Thomas, to Alfons Haar Maschinenbau GmbH & Co. KG. Feeder for introducing and feeding plates into a machine tool. 4,691,817, Cl. 198-468.200.

Habich, Michael P.: *See—*
Sudol, Walter J.; and Habich, Michael P., 4,691,927, Cl. 277-26.000.

Haboeck, Adolf: *See—*
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Haddock, Richard: *See—*
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Haden Drysys International Limited: *See—*
Marsden, Peter; and Bradwell, Paul R., 4,692,358, Cl. 427-421.000.

Haefling, James F.; Pritchard, James W.; and Stierman, Roger J., to Texas Instruments Incorporated. Coatings for ceramic bonding capillaries. 4,691,854, Cl. 228-4.500.

Hafele, Walter; and Schenk, Bernhard, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,692,102, Cl. 417-296.000.

Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, to Toyota Jidosha Kabushiki Kaisha; and OSG Mfg. Company. Rolling method and rolling tools. 4,691,551, Cl. 72-88.000.

Hahn, Gary S., to Immunetech Pharmaceuticals. Peptide antagonists for the C5a anaphylatoxin. 4,692,511, Cl. 530-325.000.

Hahn, Marlyn E., to Du Pont de Nemours, E. I., and Company. Connector with compliant retainer. 4,691,971, Cl. 439-78.000.

Hahn, Norbert, to Rite-Hite Corporation. Loading dock signal and control system. 4,692,755, Cl. 340-687.000.

Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 4,692,800, Cl. 358-106.000.

Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Hall, Larry D., to Moog Inc. Piston-and-cylinder arrangement with radially-yieldable piston head. 4,691,621, Cl. 92-184.000.

Hall, Mark J.; and Hyun, Kun S., to Dow Chemical Company, The. Vinylidene chloride interpolymer possessing improved extrudability. 4,692,508, Cl. 528-503.000.

Hall, Phillip E.: *See*—
Titus, John D.; and Hall, Phillip E., 4,691,634, Cl. 102-245.000.

Hallenbach, Werner; Lindel, Hans; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal thienylurea derivatives. 4,692,461, Cl. 514-443.000.

Haller, Irene. Disposable syringe with retractable cannula. 4,692,156, Cl. 604-195.000.

Halliburton Company: *See*—
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.
Vinson, Edward F.; and Smith, William H., 4,691,558, Cl. 73-64.100.

Hallstrom, Olof A., Jr. Reciprocating conveyor. 4,691,819, Cl. 198-750.000.

Halssig, Andreas: *See*—
Winterhalter, Walter; and Halssig, Andreas, 4,691,635, Cl. 102-251.000.

Hamamatsu Photonics Kabushiki Kaisha: *See*—
Oba, Koichiro, 4,692,938, Cl. 378-62.000.

Hamatani, Toshiji: *See*—
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Hamilton Beach Inc.: *See*—
Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

Hamilton, Harold F.; and Donahue, Robert L., to Hein-Werner Corporation. Drive-in, drive-out vehicle alignment system. 4,691,443, Cl. 33-288.000.

Hammel, Gerard. Flotation process for sludge recovery and energy conversion. 4,692,249, Cl. 210-603.000.

Hammen, Gunter: *See*—
Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, 4,692,550, Cl. 560-345.000.

Hampshire Instruments: *See*—
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Han, Myong-ja. Recliner. 4,691,890, Cl. 248-412.000.

Hanrot, Jean-Pascal; and Volpeliere, Jacky, to Aluminium Pechiney. Apparatus for distribution at a regulated rate of a fluidizable powdery material. 4,692,068, Cl. 406-89.000.

Hansen, Craig N., to Hansen Engine Corporation. Rotary pumping apparatus with radial seal assemblies on piston. 4,692,104, Cl. 418-61.00R.

Hansen Engine Corporation: *See*—
Hansen, Craig N., 4,692,104, Cl. 418-61.00R.

Hansen, James E. Holder for leaders. 4,691,471, Cl. 43-57.200.

Hansen, Lee D.: *See*—
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Hanya, Masado: *See*—
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Hanz, George J.; Jung, Guenter; and Pflaum, Michael, to Siemens Gammasonics, Inc. Detector head mounting mechanism and supporting structure. 4,692,625, Cl. 250-363.00R.

Hanzawa, Kohtaro: *See*—
Sasaki, Hiroyuki; and Hanzawa, Kohtaro, 4,691,608, Cl. 84-1.010.

Hara, Nobuhiro: *See*—
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.

Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, to Hitachi, Ltd. Pattern detecting apparatus. 4,692,690, Cl. 324-73.0PC.

Harada, Katsuhiro: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Harada, Yoshihito: *See*—
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Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, to Hitachi, Ltd. Diffusion bonding method using a high energy beam. 4,691,856, Cl. 228-194.000.

Hardesty, Donald E.: *See*—
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Haren, Doyle V.; and Wiley, Lawrence V., to Day International Corporation. A method of making a reinforced hard porous ink roll assembly. 4,691,432, Cl. 29-527.200.

Hargoaa, Francis: *See*—
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Hargrave, Karl D.: *See*—
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Harmon, Raymond E., to Rexnord Inc. Clutching adjustable keeper mechanism. 4,691,952, Cl. 292-341.180.

Harper, Terry. Sail raft - convertible inflatable life raft. 4,692,124, Cl. 441-40.000.

Harrington, David C.: *See*—
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Harrington, John H.: *See*—
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Harris Graphics Corporation: *See*—
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Harris, Mark A., to E-Systems, Inc. High power tunable filter. 4,692,724, Cl. 333-202.000.

Harris Press and Shear, Inc.: *See*—
Simpson, Edwin K., 4,691,628, Cl. 100-37.000.

Harte Industries, Inc.: *See*—
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Haru, Yasuhiko: *See*—
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Haruna, Takayuki: *See*—
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Hasegawa, Akira: *See*—
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Hashidate, Katsuro, to Casio Computer Co., Ltd. Circle and circular arc generator. 4,692,887, Cl. 364-720.000.

Hashizume, Masahiro: *See*—
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Hassall, Cedric H.; Lawton, Geoffrey; and Redshaw, Sally, to Hoffmann-La Roche Inc. Pyridazo-diazepines, diazocines, and -triazepines having anti-hypertensive activity. 4,692,438, Cl. 514-183.000.

Hassig, Robert, to Ciba-Geigy Corporation. Process for the preparation of pyrimidine derivatives. 4,692,524, Cl. 544-303.000.

Hassler, Dietrich. Method and apparatus for ultrasonically scanning a subject with an ultrasound head. 4,691,570, Cl. 73-626.000.

Hasumi, Hiroyuki, to Canon Kabushiki Kaisha. Means for restoring liquid discharge function of a liquid jet recorder. 4,692,777, Cl. 346-140.00R.

Hatanaka, Keiji: *See*—
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Hattori, Tetsuya: *See*—
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Haugse, Albert L.: *See*—
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Havel, Karel. Switch position detector and indicator with multicolor light emitter. 4,692,612, Cl. 250-229.000.

Haver & Boecker: *See*—
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Haver, Eitel F.; Lutke-Foller, Heinz; and Wossmann, Reinhard, to Haver & Boecker. Filter wire cloth. 4,691,744, Cl. 139-425.00R.

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Hayakawa, Masaru; Yoshida, Takeshi; and Kaiya, Atsushi, to Nippon Petrochemicals Co., Ltd. Binder for dry sand mold and method of its usage. 4,691,759, Cl. 164-526.000.

Hayashi, Hiroaki: *See*—
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Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, to Daido Tokushuko Kabushiki Kaisha. Apparatus for reactor iron making. 4,691,899, Cl. 266-140.000.

Hayashi, Shoji: *See*—
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Hayashi, Torahiko; and Tashiro, Yasunori, to Rheon Automatic Machinery Co., Ltd. Apparatus for cutting filled cylindrical dough body. 4,692,109, Cl. 425-308.000.

Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for stretching plastic dough. 4,692,110, Cl. 425-335.000.

Hayashi, Torahiko: *See*—
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Hayashi, Yoshikazu: *See*—
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Hayata, Naohiro, to Sumitomo Rubber Industries, Ltd. Method of making a metal mold for tire vulcanization. 4,691,431, Cl. 29-526.00R.

Hayes, Cecil E., to General Electric Company. Radio frequency field coil for NMR. 4,692,705, Cl. 324-318.000.

Hayes, Paul M.: *See*—
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Heath, James G., to Illinois Tool Works Inc. Over-center actuator switch. 4,692,572, Cl. 200-17.00R.

Hefner, Boby R., to Hefner Plastics, Inc. Hummingbird feeder. 4,691,665, Cl. 119-77.000.

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Hefner, Boby R., 4,691,665, Cl. 119-77.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Polysulfide modified epoxy resins. 4,692,500, Cl. 525-529.000.

Hegland, Philip; and Chase, Lee, to Measurex Corporation. Basis weight gauge standardizing method and system. 4,692,616, Cl. 250-252.100.

Heifetz, Carl L.: *See*—
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Heil-Quaker Corporation: *See*—
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Heindke, Armin: *See*—
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Helene Curtis, Inc.: *See*—
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Helle, Hans-Joachim, to Montanwerke Walter GmbH. Machine and process for cutting chipping-grooves into elongated peripheral milling cutters with hemispherical tips. 4,691,479, Cl. 51-165.710.

Henderson, Richard E.: *See*—
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Henderson, Roger L.: *See*—
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Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, to U.S. Philips Corporation. Method of manufacturing voltage-dependent resistor. 4,692,289, Cl. 264-61.000.

Hennion, Claude: *See*—
Lewiner, Jacques; and Hennion, Claude, 4,692,762, Cl. 340-825.690.

Herb, Armin, to "L'Oreal" . Expansion dowel with anchored state indicator. 4,692,076, Cl. 411-55.000.

Hercules Incorporated: *See*—
Reid, Donald E., 4,692,380, Cl. 428-349.000.

Herman, Fred W.: *See*—
Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., 4,692,746, Cl. 340-572.000.

Hermann, Peter: *See*—
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Herrmann, Franz: *See*—
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Herzl, Peter J., to Fischer & Porter Company. Coriolis-type mass flowmeter. 4,691,578, Cl. 73-861.380.

Hess, Wilhelm: *See*—
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Heughebaert, Jean C.: *See*—
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.

Hewlett-Packard Company: *See*—
Lawrence, Katherine, 4,692,273, Cl. 252-518.000.

Hibshman Corporation: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Hickman, James A. A. Glazing unit alarm systems. 4,692,744, Cl. 340-550.000.

Hickox, John: *See*—
Scott, James W.; and Hickox, John, 4,691,699, Cl. 128-91.00A.

Hidaka, Hideto: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.

Higashimoto Kikai Co., Ltd.: *See*—
Higashimoto, Tsuyoshi, 4,691,411, Cl. 17-49.000.

Higashimoto, Tsuyoshi, to Higashimoto Kikai Co., Ltd. Method and apparatus for feeding meat. 4,691,411, Cl. 17-49.000.

Higbee, Wallace C., to TRW Automotive Products Inc. Planetary inertial seat belt retractor. 4,691,875, Cl. 242-107.40B.

Highstreet, Edward J.: *See*—
Stannard, Forrest B.; and Highstreet, Edward J., 4,692,248, Cl. 210-403.000.

Highton, Frederick J., to Burr-Brown Corporation. Level shifting circuitry for serial-to-parallel converter. 4,692,641, Cl. 307-475.000.

Higuchi, Kazuhiko: *See*—
Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, 4,692,812, Cl. 358-285.000.

Hilger, Gerald E., to Cormed, Inc. Multiple vascular access port. 4,692,146, Cl. 604-93.000.

Hilgren, Wallace L. Solvent cleansing apparatus. 4,692,251, Cl. 210-651.000.

Hill, Delmar J., to Vanguard-Hill, Inc. Tape fastening system. 4,691,427, Cl. 29-426.500.

Hillstrom, David U.: *See*—
Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, 4,691,892, Cl. 248-624.000.

Hilti Aktiengesellschaft: *See*—
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, 4,691,929, Cl. 279-19.300.

Himmler, Gunther; and Knoll, Gunter, to Gebr. Hofmann GmbH & Co. KG. Maschinenfabrik. Apparatus for determination of the static unbalance in a body. 4,691,567, Cl. 73-483.000.

Hindley, Richard M.; and Berge, John, to Beecham Group PLC. 2-phenylethylamine derivatives. 4,692,465, Cl. 514-539.000.

Hinds, George P., Jr.: *See*—
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Hinkel, Holger: *See*—
Bandara, Upali; and Hinkel, Holger, 4,692,832, Cl. 360-137.000.

Hinooka, Nobuya: *See*—
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.

Hipp, J. Michael: *See*—
Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., 4,692,544, Cl. 560-4.000.

Hipp, Ruth H.: *See*—
Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., 4,692,544, Cl. 560-4.000.

Hirabayashi, Yuji; Noguchi, Masato; and Hatanaka, Keiji, to Nissan Motor Co., Ltd. Supercharger pressure control system for internal combustion engine with turbocharger. 4,691,521, Cl. 60-602.000.

Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, to Kabushiki Kaisha Toshiba. Picture image reader. 4,692,812, Cl. 358-285.000.

Hirai, Bunji: *See*—
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,651, Cl. 310-323.000.

Hiramatsu, Akira: *See*—
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Hirao, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Method for fabricating a bipolar semiconductor device by undercutting and local oxidation. 4,691,436, Cl. 437-33.000.

Hirose Manufacturing Company, Limited: *See*—
Hirose, Tokuzo, 4,691,648, Cl. 112-121.110.

Hirose, Naohiro: *See*—
Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, 4,692,393, Cl. 430-59.000.

Hirose, Tokuzo, to Hirose Manufacturing Company, Limited. Device for detecting the residual amount of bobbin thread in a lock stitch sewing machine. 4,691,648, Cl. 112-121.110.

Hirota, Akio, to Brother Kogyo Kabushiki Kaisha. Thread cutting machine. 4,692,071, Cl. 408-9.000.

Hirota, Toshio, to Fuji Electric Company, Ltd. Cell stack assembly structure for fuel cell. 4,692,391, Cl. 429-34.000.

Hisano, Junichi: *See*—
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.

Hitachi Construction Machinery Co., Ltd.: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Aoki, Akira; and Ukigaya, Fumio, 4,692,804, Cl. 358-163.000.
Hitachi, Ltd.: *See*—
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC.
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.
Ishihara, Heigo; and Ohno, Tomoyuki, 4,692,378, Cl. 428-340.000.
Kiriu, Yoshio; Kaneko, Shigeru; and Kosuge, Hiroshi, 4,692,922, Cl. 371-37.000.
Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, 4,691,983, Cl. 350-96.120.
Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,653, Cl. 310-334.000.
Masuzaki, Hidefumi; and Horikawa, Etsuo, 4,692,944, Cl. 382-41.000.
Nihei, Masayasu; Suwa, Masateru; and Chigasaki, Mitsuo, 4,692,230, Cl. 204-192.310.
Okamoto, Yukio; and Shinada, Shinichi, 4,692,666, Cl. 315-169.400.
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.
Shoji, Moritaka; Yamazaki, Takeo; and Ogihara, Satoru, 4,692,735, Cl. 338-21.000.
Takahashi, Kenichi, 4,692,600, Cl. 235-379.000.
Tenma, Tadashi; Akashi, Kichizo; Konishi, Yozo; and Watase, Hideo, 4,692,876, Cl. 364-513.000.
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.
Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,692,757, Cl. 340-721.000.
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.
Yamaoka, Akira; Wada, Kenichi; and Kuriyama, Kazunori, 4,692,891, Cl. 364-763.000.
Hitachi Medical Corporation: *See*—
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.
Hitachi Microcomputer Engineering, Ltd.: *See*—
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.
Hiyama, Isao: *See*—
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.
Hochtemperatur-Reaktorbau GmbH: *See*—
Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, 4,692,301, Cl. 376-391.000.
Hockert, Eric N.: *See*—
Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., 4,691,993, Cl. 350-105.000.
Hodge, Harold F., to Cook's Truck Body Mfg., Inc. Counterbalanced tailgate for dump boxes. 4,691,956, Cl. 296-51.000.
Hodgson, Derek: *See*—
Maycock, Ian C.; and Hodgson, Derek, 4,691,815, Cl. 192-98.000.
Hoechst Aktiengesellschaft: *See*—
Betz, Thomas; von Schnering, Hans-Georg; and Schonherr, Erich, 4,692,203, Cl. 156-610.000.
Bieringer, Hermann; and Schwerdtle, Friedhelm, 4,692,181, Cl. 71-86.000.
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,692,837, Cl. 361-313.000.
Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, 4,692,547, Cl. 560-186.000.
Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, 4,692,026, Cl. 356-345.000.
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.
Pieper, Werner, 4,692,281, Cl. 260-502.40R.
Pieper, Werner, 4,692,282, Cl. 260-502.40P.
Schorr, Manfred; and Schmitt, Wilfried, 4,692,523, Cl. 540-533.000.
Sulzbach, Reinhard A.; and von Werner, Konrad, 4,692,493, Cl. 524-805.000.
Zeiss, Hans-Joachim; and Mildenberger, Hilmar, 4,692,541, Cl. 558-87.000.
Hoereth, Hans-Jurgen: *See*—
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, 4,691,929, Cl. 279-19.300.
Hoffman, Gregory C. Holster mount. 4,691,396, Cl. 5-503.000.
Hoffman, Reinhold; and Klimke, Walter, to Interlock Corporation. Device for chilling stream of gas-suspended particles. 4,691,865, Cl. 239-690.000.
Hoffmann-La Roche Inc.: *See*—
Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, 4,692,450, Cl. 514-256.000.
Hassall, Cedric H.; Lawton, Geoffrey; and Redshaw, Sally, 4,692,438, Cl. 514-183.000.
Hofmann, Raimund, to Folkmar, Jan. Receptacle with at least two chambers for accommodating liquids and pulverized substance, especially coffee powder, milk and/or sugar. 4,691,821, Cl. 206-216.000.
Hogel, Joseph E.: *See*—
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.
Holden, Harold C.; and Holden, June. Alarm system. 4,692,743, Cl. 340-544.000.
Holden, June: *See*—
Holden, Harold C.; and Holden, June, 4,692,743, Cl. 340-544.000.
Holdt, Donald H., to Cambridge Technologies, Inc. Convertible wheelchair/litter. 4,691,962, Cl. 297-84.000.
Holley Engineering Company, Inc.: *See*—
Holley, John D., 4,691,639, Cl. 104-16.000.
Holley, John D., to Holley Engineering Company, Inc. Rail tie plate placing vehicle and method. 4,691,639, Cl. 104-16.000.
Holloway, Oris E., Jr.: *See*—
Gannis, Peter M.; Wilkins, Howard; and Holloway, Oris E., Jr., 4,692,342, Cl. 426-293.000.
Holobaugh, Raymond E.: *See*—
Rogers, Walter C., Jr.; and Holobaugh, Raymond E., 4,691,961, Cl. 297-61.000.
Holscher, Hugo, to Shell Oil Company. Energy storage and recovery. 4,691,524, Cl. 60-652.000.
Holzapfel, Heinz: *See*—
Reckziegel, Erich; and Holzapfel, Heinz, 4,692,370, Cl. 428-198.000.
Homma, Takahiko; and Wada, Shigetaka, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Rotary component of a rotary device for heat engines and a method of manufacturing the same. 4,692,099, Cl. 416-229.00A.
Homs, Marinus H.: *See*—
van den Berg, Wilhemus H.; Homs, Marinus H.; and van Oorschot, Bob P. J., 4,691,572, Cl. 73-643.000.
Honda Giken Kogyo K.K.: *See*—
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kadono, Kohji; and Tsunoda, Minoru, 4,691,800, Cl. 180-219.000.
Nishikawa, Masao; and Sakurai, Yoshimi, 4,691,596, Cl. 74-869.000.
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.
Honda Manufacturing Co., Ltd.: *See*—
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.
Honeycutt, Thomas E.: *See*—
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.
Honeywell B.V.: *See*—
Berkhof, Hendrikus, 4,692,574, Cl. 200-81.500.
Honeywell Inc.: *See*—
Meyer, David A.; Tasson, Brian B.; Vollmer, Robert F.; and Warren, J. Bruce, 4,691,638, Cl. 102-434.000.
Hoogenboom, Leo, to Mechanical Technology Incorporated. Fiber optic proximity sensor with feedback servo imaging means. 4,692,611, Cl. 250-227.000.
Hoover, Alan A., to RCA Corporation. Switching power supply with raster width stabilization. 4,692,852, Cl. 363-21.000.
Hoppie, Lyle O., to Eaton Corporation. Method and apparatus for maximizing internal combustion engine work output by controlled heat release. 4,691,682, Cl. 123-558.000.
Hoppner, Klaus; and Kiefel, Bernhard, to Andreas Stihl. Arrangement for controlling the intake air for the carburetor of a hand-held portable tool. 4,691,681, Cl. 123-556.000.
Hori, Nobuo: *See*—
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.
Hori, Seiji: *See*—
Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, 4,692,573, Cl. 200-50.00C.
Hori, Yasuhiko: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.
Horiba, Ltd.: *See*—
Kumakura, Koichi; and Hosokawa, Yoshinori, 4,691,793, Cl. 177-50.000.
Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, 4,692,935, Cl. 378-49.000.
Horikawa, Etsuo: *See*—
Masuzaki, Hidefumi; and Horikawa, Etsuo, 4,692,944, Cl. 382-41.000.
Horikawa, Yoshio: *See*—
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Borated hydroxy-containing compositions and lubricants containing same. 4,692,257, Cl. 252-49.600.
Horton, James B. Plunger valve apparatus for oil well pump. 4,691,735, Cl. 137-494.000.

Hosoda, Kenichiro: *See*—
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,692,725, Cl. 333-203.000.

Hosokawa, Yoshinori: *See*—
Kumakura, Koichi; and Hosokawa, Yoshinori, 4,691,793, Cl. 177-50.000.
Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, 4,692,935, Cl. 378-49.000.

Hosomi, Hisashi: *See*—
Suzuki, Yoshio; Yamamoto, Mitsuoki; and Hosomi, Hisashi, 4,692,065, Cl. 405-211.000.

Hostetler, Karl Y.; and Deftos, Leonard J., to University of California, The Regents of the. Method and composition for regulating serum calcium levels of mammals. 4,692,433, Cl. 514-12.000.

Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, to Mazda Motor Corp. Throttle valve control system for internal combustion engine. 4,691,677, Cl. 123-399.000.

Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, to Hitachi, Ltd. Forced flow cooling-type superconducting coil apparatus. 4,692,560, Cl. 174-15.0CA.

Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, to Fried, Krupp GmbH. Process for producing ethanol. 4,692,218, Cl. 203-19.000.

House, Gary L., to Eastman Kodak Company. Photographic emulsions and elements containing sensitizing dye in the form of host crystals. 4,692,401, Cl. 430-570.000.

Hovey, Isabel: *See*—
Nowak, Frederick H.; and Hovey, Isabel, 4,691,808, Cl. 187-125.000.

Howard, H. Keith; and Sherrill, Jimmy L., to Tutco, Inc. Coil support insulator for an electric heater. 4,692,599, Cl. 219-532.000.

Howard, William H.: *See*—
Gilbert, David S., 4,691,610, Cl. 84-327.000.

Howland, Warren W.; Arquette, Robert E.; and Wu, Shang-Ren, to Henkel Corp. Use of etherified polygalactomannan gums as carbonaceous slurry stabilizers. 4,692,169, Cl. 44-51.000.

Hsiung, Shu-Jen. Joint arrangement for knockdown furniture. 4,691,965, Cl. 297-440.000.

Hsu, Chi-Ching, to Multitech Industrial Corporation. Method and a system for composing the pattern of the chinese character. 4,692,865, Cl. 364-419.000.

Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., to Exxon Chemical Patents Inc. Process for the removal of solids from an oil. 4,692,237, Cl. 208-177.000.

Huddleston, Elwyn G., to Kendall Company, The. Method of making an adhesive tape. 4,692,352, Cl. 427-208.400.

Huffman, Jacque S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Microprocessor peripheral access control circuit. 4,692,895, Cl. 364-900.000.

Hughes Aircraft Company: *See*—
Beining, August H.; and Smith, William A., 4,692,809, Cl. 358-247.000.
Ellion, M. Edmund; and Wolff, George, 4,692,559, Cl. 136-262.000.
Klatt, Robert W., 4,692,618, Cl. 250-330.000.
Wheeler, Bryce A., 4,691,999, Cl. 350-620.000.

Hughes Tool Company: *See*—
Wheeler, Dale E., 4,691,430, Cl. 29-451.000.

Hujita, Yutaka, to Tokyo Electric Co., Ltd. Pulse motor. 4,692,679, Cl. 318-696.000.

Huls Aktiengesellschaft: *See*—
Lohrengel, Gregor, 4,692,482, Cl. 523-340.000.

Hultsch, Gunther: *See*—
Alstetter, Franz; Schiele, Herbert; Sedlmayer, Peter; and Hultsch, Gunther, 4,691,448, Cl. 34-8.000.

Hunt, Russell G.: *See*—
West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., 4,692,457, Cl. 514-361.000.

Hunter, Byron A.: *See*—
Rowland, Donald G.; Hunter, Byron A.; and Hansen, Lee D., 4,692,475, Cl. 521-92.000.

Hurlbut, Donovan W.: *See*—
Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., 4,692,913, Cl. 369-44.000.

Huschelrath, Gerhard; and Diehl, Herbert, to Nukem GmbH. Device with two generators for measuring the gradients of magnetic fields. 4,692,702, Cl. 324-251.000.

Hutchin, Richard A.: *See*—
MacGovern, Alan J.; and Hutchin, Richard A., 4,692,027, Cl. 356-353.000.

Huther, Werner: *See*—
Rossmann, Axel; and Huther, Werner, 4,692,288, Cl. 264-56.000.

Hutterer, Werner: *See*—
Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, 4,691,813, Cl. 192-13.00R.

Hwang, Tzong: *See*—
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.

Hyner, Jacob; and Gradowski, Steven, to Whyco Chromium Company, Inc. Self drilling fasteners and process for making the same. 4,692,080, Cl. 411-387.000.

Hyodo, Youichi, to Toyota Jidosha Kabushiki Kaisha. Four-wheel steering system for automotive vehicles. 4,691,932, Cl. 280-91.000.

Hyuga, Takehiro: *See*—
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.

Hyun, Kun S.: *See*—
Hall, Mark J.; and Hyun, Kun S., 4,692,508, Cl. 528-503.000.

Ichida, Hiroshi: *See*—
Ichimura, Kenichi; and Ichida, Hiroshi, 4,692,392, Cl. 430-46.000.

Ichida, Nobuyuki: *See*—
Sato, Takuso; and Ichida, Nobuyuki, 4,691,569, Cl. 73-596.000.

Ichihara, Issey: *See*—
Tachibna, Natsuki; and Ichihara, Issey, 4,691,663, Cl. 118-658.000.

Ichihara, Takashi, to Kabushiki Kaisha Toshiba. Emission computed tomography apparatus. 4,692,624, Cl. 250-363.00S.

Ichiki, Masahiro: *See*—
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.

Ichikoh Industries, Ltd.: *See*—
Wada, Yasuto; Ishiyama, Yoshihiko; and Yamashita, Makoto, 4,692,000, Cl. 350-637.000.

Ichimura, Hiroshi: *See*—
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.

Ichimura, Kenichi; and Ichida, Hiroshi, to Ishihara Sangyo Kaisha, Ltd. Color electrophotographic process uses layered photosemitive element having conductive film on side portion. 4,692,392, Cl. 430-46.000.

Ida, Takanori: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.

Ife, Robert J., to Smith Kline & French Laboratories Limited. 3-Pyridylaminoalkyleneamino-4-amino-1,2,5-thiadiazole-1-oxides, composition containing them, and use of them to block histamine h_2-receptors. 4,692,456, Cl. 514-333.000.

Igarashi, Keiichi: *See*—
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.

Igarashi, Noriyuki: *See*—
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.

Iida, Takeo: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Iijima, Toshifumi: *See*—
Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, 4,692,400, Cl. 430-553.000.

Iiyama, Hiroshi: *See*—
Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, 4,692,613, Cl. 250-231.0SE.

Ikawa, Shoji: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Ikeda Bussan Co., Ltd.: *See*—
Maruyama, Hidekazu, 4,691,966, Cl. 297-452.000.

Ikeda, Hideo, to Sanden Corporation. Control device for refrigerated display case. 4,691,527, Cl. 62-234.000.

Ikeda, Keichi: *See*—
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Ikeda, Sakio; and Yonamine, Shozen, to Dynic Corporation; and Mine Kinzoku Kogyo K.K. Cigarettes. 4,691,717, Cl. 131-365.000.

Ikeda, Toshimichi: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Ikegami, Hiroo: *See*—
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, to Kabushiki Kaisha Ikeuchi Tekkosho. Method for producing a food product simulating shellfish. 4,692,341, Cl. 426-250.000.

Ikeuchi, Kiyoaki: *See*—
Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, 4,692,341, Cl. 426-250.000.

Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, to Toyo Seikan Kaisha, Ltd. Process for preparing a sealed laminated vessel. 4,692,132, Cl. 493-103.000.

Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, to NGK Insulators, Ltd. Electroconductive spring material. 4,692,192, Cl. 148-12.70C.

Ikuta, Kunio, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for forming the address signals of a screen memory of a half tone dot generator. 4,692,879, Cl. 364-518.000.

Illinois Tool Works Inc.: *See*—
Heath, James G., 4,692,572, Cl. 200-17.00R.
Klygis, Mindaugas J., 4,691,860, Cl. 229-52.00A.
Singery, Denis C.; and Gordon, Ronald O., 4,692,154, Cl. 604-172.000.

Illy, Hugo; Schliebs, Bjorn; and Hess, Wilhelm, to Ciba-Geigy Corporation. Process for the preparation of cyclic phosphites. 4,692,540, Cl. 558-78.000.

Imaizumi, Norio, to Sanyo Electric Co. Vertical deflection circuit. 4,692,670, Cl. 315-388.000.

Imano, Shigeki: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.

Imato, Shinji: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Imazu, Katsuhiro: *See*—
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Imiolek, Henry S.: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Immunetech Pharmaceuticals: *See*—
Hahn, Gary S., 4,692,511, Cl. 530-325.000.

Imose, Masayuki, to Chugai Ro Co., Ltd. Continuous annealing furnace for metallic strip. 4,691,898, Cl. 266-89.000.

Imperial Biotechnology Limited: *See*—
Banks, Geoffrey T.; and Browning, Paul D., 4,692,408, Cl. 435-104.000.

Imperial Chemical Industries plc: *See*—
Wem, James; and Brierley, Rowland J. P., 4,692,283, Cl. 261-89.000.

Inagaki, Masahisa: *See*—
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Inagaki, Tsuguya: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, to Daido Tokushuko Kabushiki Kaisha. Method and apparatus for winding wire rod. 4,691,874, Cl. 242-80.000.

Industrial Adhesives, Inc.: *See*—
Getz, John L., 4,692,202, Cl. 156-554.000.

Inficon Leybold-Heraeus: *See*—
Gogol, Carl A., 4,692,630, Cl. 250-573.000.

Ingham, Paul: *See*—
Greaves, Brian; and Ingham, Paul, 4,692,315, Cl. 422-18.000.

Ingle, Frank W.; and Claude, John P., to Medasonics Inc. Ultrasonic transducer method. 4,691,418, Cl. 29-25.350.

Ingram, Alvin R.; and DiGiulio, Adolph V., to Atlantic Richfield Company. Divinylbenzene in expandable beads for cup molding. 4,692,472, Cl. 521-60.000.

Inmos Limited: *See*—
May, Michael D., 4,692,861, Cl. 364-200.000.

Innovator Mernok Kisszovetkezet: *See*—
Gyorgy, Makara, 4,691,472, Cl. 47-58.000.

Inoue, Yasukazu: *See*—
Fukuzo, Yukio; and Inoue, Yasukazu, 4,692,642, Cl. 307-530.000.

Insolio, Thomas A. Constant force manual glass cutter. 4,691,438, Cl. 30-164.950.

Institut Fiziki Zemli Imeni O.Ju. Shmidta Akademii Nauk SSSR: *See*—
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

Institut fur Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Institute Electrosvarki Imeni Patona: *See*—
Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., 4,692,585, Cl. 219-130.400.

Institute of Gas Tehnology: *See*—
Bodle, William W.; and Tarman, Paul B., 4,692,238, Cl. 208-407.000.

Interlock Corporation: *See*—
Hoffman, Reinhold; and Klimke, Walter, 4,691,865, Cl. 239-690.000.

International Business Machines Corporation: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.
Aviram, Ari; and Shih, Kwang K., 4,692,044, Cl. 400-241.100.
Bandara, Upali; and Hinkel, Holger, 4,692,832, Cl. 360-137.000.
Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., 4,692,877, Cl. 364-514.000.
Casper, Daniel F., 4,692,893, Cl. 364-900.000.
Fawcett, Bradley W.; and Sendelbach, Lee A., 4,692,758, Cl. 340-735.000.
Findlay, Hugh T., 4,692,395, Cl. 430-254.000.
McBride, Donald G.; and Rickert, Robert G., 4,692,346, Cl. 427-8.000.
Ngai, Chuck H.; and Watkins, Gerald J., 4,692,633, Cl. 307-269.000.
Roucek, Joseph A.; and Tessier, James R., 4,691,426, Cl. 29-402.180.
Rubloff, Gary W.; and Wittmer, Marc F., 4,692,348, Cl. 437-82.000.
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.
Sueta, Yoshihisa, 4,692,691, Cl. 324-73.00R.

International Paper Company: *See*—
Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., 4,692,212, Cl. 162-206.000.

International Shoe Machine Corporation: *See*—
Leeper, Alan L., 4,692,133, Cl. 493-128.000.

Interscan, Incorporated: *See*—
Rice, Mark; and Meisner, Douglas, 4,692,006, Cl. 354-75.000.

Inujima, Takashi: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Ipri, Alfred C.: *See*—
Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., 4,692,344, Cl. 427-39.000.

Irvine, Sheila M.; Penman, Alistair; and Wood, Geoffrey B. Milk substitute. 4,692,338, Cl. 426-2.000.

Ise Electronics Corporation: *See*—
Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, 4,692,663, Cl. 313-495.000.

Iseki, Takeo, to Tomy Kogyo Co., Inc. Automated game panel. 4,691,921, Cl. 273-85.00B.

Isenberg, Arnold O.; and Ruka, Roswell J., to Westinghouse Electric Corp. Protective interlayer for high temperature solid electrolyte electrochemical cells. 4,692,274, Cl. 252-521.000.

Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, to Kabushiki Kaisha Toshiba. Toroidal winding apparatus. 4,691,872, Cl. 242-4.00R.

Ishida, Mikio: *See*—
Ishimori, Shoso; Ishiizumi, Seiichi; and Ishida, Mikio, 4,691,802, Cl. 180-291.000.

Ishiguro, Masato: *See*—
Monma, Hideo; Ishiguro, Masato; and Kawano, Tetsuo, 4,692,783, Cl. 357-42.000.

Ishihara, Heigo; and Ohno, Tomoyuki, to Hitachi, Ltd. Magnetic recording media. 4,692,378, Cl. 428-340.000.

Ishihara Sangyo Kaisha, Ltd.: *See*—
Ichimura, Kenichi; and Ichida, Hiroshi, 4,692,392, Cl. 430-46.000.

Ishii, Fumio: *See*—
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.

Ishii, Koji; and Okuda, Yukito, to Ryobi Ltd. Cylinder setting mechanism for an offset printing machine. 4,691,631, Cl. 101-218.000.

Ishii, Susumu: *See*—
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Ishii, Tadashi: *See*—
Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, 4,692,741, Cl. 340-392.000.

Ishiizumi, Seiichi: *See*—
Ishimori, Shoso; Ishiizumi, Seiichi; and Ishida, Mikio, 4,691,802, Cl. 180-291.000.

Ishikawa, Kikuo: *See*—
Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, 4,691,447, Cl. 34-4.000.

Ishikawa, Ryosuke: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Ishikawa, Syuhei: *See*—
Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, 4,692,192, Cl. 148-12.70C.

Ishikawa, Youhei: *See*—
Wakino, Kikuo; Tamura, Hiroshi; and Ishikawa, Youhei, 4,692,727, Cl. 333-219.000.

Ishimori, Shoso; Ishiizumi, Seiichi; and Ishida, Mikio, to Kubota, Ltd. Agricultural tractor. 4,691,802, Cl. 180-291.000.

Ishinabe, Masao: *See*—
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, to Toshiba Ceramics Co., Ltd. Immersion nozzle for continuous casting. 4,691,844, Cl. 222-591.000.

Ishiyama, Yoshihiko: *See*—
Wada, Yasuto; Ishiyama, Yoshihiko; and Yamashita, Makoto, 4,692,000, Cl. 350-637.000.

Ishizuka, Kho: *See*—
Izukawa, Kazuhiro; and Ishizuka, Kho, 4,692,649, Cl. 310-316.000.

Isomura, Hiroyasu: *See*—
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,691,499, Cl. 53-451.000.

Isono, Kunihiro: *See*—
Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, 4,692,436, Cl. 514-129.000.

Israelson, Gordon A., to Westinghouse Electric Corp. Thermal expansion compensating back flush manifold. 4,692,176, Cl. 55-302.000.

Itaba, Tunesaku: *See*—
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,691,591, Cl. 74-606.00A.

Itek Corporation: *See*—
MacGovern, Alan J.; and Hutchin, Richard A., 4,692,027, Cl. 356-353.000.

Itek Graphix Corp.: *See*—
Ebser, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., 4,691,987, Cl. 350-96.230.
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, to Tokyo Keiki Company, Ltd. Apparatus for steering joystick of ship. 4,691,659, Cl. 114-144.00R.
Ito, Yujiro; Kamatsu, Yasutoshi; and Otobe, Takashi, to Sony Corporation. Dielectric rotary coupler. 4,692,721, Cl. 333-109.000.
Itoh, Senji: *See*—
Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, 4,692,132, Cl. 493-103.000.
Itou, Takeo: *See*—
Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, 4,692,659, Cl. 313-402.000.
ITT Industries, Inc.: *See*—
Fink, Werner; and Bohn, Heinz, 4,692,101, Cl. 417-68.000.
Ivanov, Alexei S.: *See*—
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.
Iwadachi, Takaharu: *See*—
Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, 4,692,192, Cl. 148-12.70C.
Iwadate, Kazumi: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, to Kabushiki Kaisha Toshiba; and Tosbac Computer System Co., Ltd. Electrostatic discharge protection circuit with variable limiting threshold for MOS device. 4,692,834, Cl. 361-91.000.
Iwai, Shiyougo, to Sharp Kabushiki Kaisha. Automatic duplex copying machine and method of treating paper jamming therefor. 4,692,022, Cl. 355-24.000.
Iwaki, Masato, to Mazda Motor Corp. Idling speed control systems for internal combustion engines. 4,691,675, Cl. 123-339.000.
Iwako, Motonari; and Nakao, Masaaki, to Kabushiki Kaisha Hunken. Method and apparatus for continuously mixing and kneading pulverulent bodies such as pulverized coal, oil coke to prepare slurry thereof. 4,691,867, Cl. 241-21.000.
Iwanaga, Yushi: *See*—
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.
Iwanski, Donald P., to PPG Industries, Inc. Calcium hypochlorite tablet. 4,692,335, Cl. 424-149.000.
Iwasaki, Hikoji: *See*—
Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, 4,692,741, Cl. 340-392.000.
Iwasaki, Kiyoshi: *See*—
Takai, Kiyoshi; and Iwasaki, Kiyoshi, 4,692,113, Cl. 432-72.000.
Iwasaki, Yutaka: *See*—
Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, 4,692,741, Cl. 340-392.000.
Iwata, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 4,691,807, Cl. 187-117.000.
Iwayama, Kenzo: *See*—
Yoshitomi, Yasunari; Kuroki, Katsuro; and Iwayama, Kenzo, 4,692,193, Cl. 148-111.000.
Izawa, Susumu: *See*—
Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, 4,692,507, Cl. 528-481.000.
Izukawa, Kazuhiro; and Ishizuka, Kho, to Canon Kabushiki Kaisha. Driving circuit of a vibration wave motor. 4,692,649, Cl. 310-316.000.
Izukawa, Kazuhiro: *See*—
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.
Izumi, Yoshinori: *See*—
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.
J. B. Golf Enterprises, Inc.: *See*—
Strong, Michael P., 4,691,924, Cl. 273-189.00R.
J.M. Voith GmbH: *See*—
Schiel, Christian; and Kotitschke, Herbert, 4,691,420, Cl. 29-116.00R.
Schiel, Christian, 4,691,421, Cl. 29-116.0AD.
Jacks, Richard P.; and Sprague, Richard P., to First Byte. Real-time text-to-speech conversion system. 4,692,941, Cl. 381-52.000.
Jackson, Hiram S.: *See*—
Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., 4,692,734, Cl. 337-162.000.
Jackson, James G., III. Water-bag dam or dike and method. 4,692,060, Cl. 405-115.000.
Jackson, Philip. Screen comprising a travelling endless screening band. 4,692,242, Cl. 210-160.000.
Jacob, Herbert: *See*—
Lampert, Ingolf; and Jacob, Herbert, 4,692,223, Cl. 204-34.500.
Jacobina, Charles E., to Celotex Corporation, The. Polyisocyanurate foams derived from oxypropylated polyols and insulating structures therefrom. 4,692,477, Cl. 521-174.000.
Jacobs, Hans-Juergen: *See*—
Ehrig, Dietrich; and Jacobs, Hans-Juergen, 4,691,515, Cl. 60-526.000.
Jacobson, Luke. Bass drum pedal. 4,691,613, Cl. 84-422.00R.
Jaffe, Edward E.: *See*—
Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, 4,692,189, Cl. 106-308.00S.
Jagenberg Aktiengesellschaft: *See*—
Zodrow, Rudolf; and Tomashauser, Josef, 4,692,201, Cl. 156-488.000.
Jahn, Dieter: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.
Jahn-Held, Wilhelm: *See*—
Lindorfer, Walter; and Jahn-Held, Wilhelm, 4,692,061, Cl. 405-128.000.
Jailor, John J.: *See*—
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.
Jallen, Gale A.; and Bonnie, Gene P., to Control Data Corp. Bubble memory bias field structure. 4,692,898, Cl. 365-27.000.
James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., to Allied Corporation. Oxidation of ammonia over a mixed catalyst bed of cobalt and aluminum oxides. 4,692,321, Cl. 423-404.000.
James River Corporation: *See*—
Bouchette, Michael P., 4,692,374, Cl. 428-288.000.
Jandy Industries, Inc.: *See*—
Johnson, Bruce R.; and Falconer, Ralph A., 4,691,732, Cl. 137-268.000.
Janome Sewing Machine Co. Ltd.: *See*—
Sano, Yasuro, 4,691,655, Cl. 112-466.000.
Jansen, Norman A.; and Randall, Beryl D. Apparatus for taking up and playing out lines. 4,691,806, Cl. 187-9.00R.
Janusz, John M., to Procter & Gamble Company, The. Alpha-L-aspartyl-D-phenylglycine esters and amides useful as high intensity sweeteners. 4,692,512, Cl. 530-801.000.
Janusz, John M.: *See*—
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.
Japan Gore-Tex, Inc.: *See*—
Nomi, Haruo, 4,692,369, Cl. 428-198.000.
Japan Styrene Paper Corporation: *See*—
Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, 4,692,507, Cl. 528-481.000.
Javna, Stephen L.: *See*—
Berlin, Richard B.; Berlin, Richard B., Jr.; and Javna, Stephen L., 4,692,153, Cl. 604-171.000.
Jeco Co., Ltd.: *See*—
Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, 4,692,613, Cl. 250-231.0SE.
Jens, Michael J.: *See*—
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.
Jensen, Erling. Frying device. 4,691,690, Cl. 126-390.000.
Jensen, Martin J.: *See*—
Cooley, Stephen E.; and Jensen, Martin J., 4,692,591, Cl. 219-295.000.
Jeschke, Peter: *See*—
Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, 4,692,260, Cl. 252-99.000.
Jeumont-Schneider Corporation: *See*—
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, 4,692,862, Cl. 364-200.000.
Jewer, Alan A.: *See*—
Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., 4,692,913, Cl. 369-44.000.
Jidosha Kiki Co., Ltd.: *See*—
Andoh, Munesato, 4,691,519, Cl. 60-535.000.
Jimbou, Ryutaro: *See*—
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.
Jimenez, Angel F.: *See*—
Bennett, William; and Jimenez, Angel F., 4,692,081, Cl. 414-22.000.
Johansen, Kent: *See*—
Skovgaard, Helge; and Johansen, Kent, 4,692,882, Cl. 364-565.000.
John D. Brush & Co., Inc.: *See*—
Beattie, Patrick J., 4,691,544, Cl. 70-329.000.
John Lysaght (Australia) Limited: *See*—
Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., 4,691,547, Cl. 72-16.000.
John O. Butler Company: *See*—
Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., 4,691,404, Cl. 15-167.00R.
John, Thomas: *See*—
Ehrlenspiel, Klaus; John, Thomas; and Streinz, Wolfgang, 4,692,126, Cl. 464-103.000.
Johnson, Bruce R.; and Falconer, Ralph A., to Jandy Industries, Inc. Pool chlorinator. 4,691,732, Cl. 137-268.000.
Johnson, David W., Jr.: *See*—
Cohen, Leonard G.; Johnson, David W., Jr.; and MacChesney, John B., 4,691,990, Cl. 350-96.330.
Johnson, Duane R.: *See*—
Pugh, James G.; Johnson, Duane R.; and Bartholomew, Roy E., 4,691,968, Cl. 303-52.000.

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Grooms, John M.; and Jones, Mark A., 4,691,731, Cl. 137-205.000.

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Jost, Alfred: *See*—
Heinemann, Horst D.; and Jost, Alfred, 4,691,482, Cl. 52-3.000.

Joyner, Kenneth E., Jr.: *See*—
Whitten, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., 4,691,868, Cl. 241-24.000.

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Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,691,408, Cl. 16-241.000.
Rock, Erich; and Schwarzler, Felix, 4,692,035, Cl. 384-18.000.

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Jung, Guenter: *See*—
Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,692,625, Cl. 250-363.00R.

Junino, Alex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, to L'Oreal. Use of halogenated 4,5-methylenedioxyphenol in the dyeing of keratinous fibres. 4,692,166, Cl. 8-410.000.

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Center, Warren A., 4,691,442, Cl. 33-253.000.

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Miyata, Tsutomu; and Nagai, Masahide, 4,692,881, Cl. 364-551.000.

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Kishi, Mitsuihiro, 4,691,805, Cl. 187-9.00R.

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Iwako, Motonari; and Nakao, Masaaki, 4,691,867, Cl. 241-21.000.

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Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, 4,692,341, Cl. 426-250.000.

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Akesaka, Toshio, 4,691,787, Cl. 173-145.000.
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Shintani, Fumio, 4,691,792, Cl. 177-1.000.

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Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,691,591, Cl. 74-606.00A.

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Sakuma, Shuji; and Fujinawa, Hirotaka, 4,691,718, Cl. 132-84.00R.

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Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, 4,692,573, Cl. 200-50.00C.

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Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, 4,692,812, Cl. 358-285.000.
Ichihara, Takashi, 4,692,624, Cl. 250-363.00S.
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,691,872, Cl. 242-4.00R.
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.
Kimura, Seiichiro; and Aoki, Hidekazu, 4,692,583, Cl. 219-121.00L.
Komatsu, Shigeru, 4,692,190, Cl. 437-189.000.
Kuroiwa, Akihiko; and Saito, Suzuo, 4,692,855, Cl. 363-95.000.
Mihara, Yuji, 4,692,874, Cl. 364-483.000.
Miyasako, Yoji, 4,692,711, Cl. 330-257.000.
Shikata, Hiroshi, 4,692,070, Cl. 407-104.000.
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Tachibna, Natsuki; and Ichihara, Issey, 4,691,663, Cl. 118-658.000.
Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, 4,692,659, Cl. 313-402.000.
Tanaka, Sumio; Saito, Shinji; and Atsumi, Shigeru, 4,692,902, Cl. 365-210.000.
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Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, 4,691,526, Cl. 62-217.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Homma, Takahiko; and Wada, Shigetaka, 4,692,099, Cl. 416-229.00A.
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

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Kadogawa, Kouji; and Watanabe, Tsunenori, to Leader Company Limited. Shoe making machine. 4,691,398, Cl. 12-77.000.

Kadokura, Norihisa, to Alliance Research Corporation. Vehicle window mount for portable antenna. 4,692,770, Cl. 343-715.000.

Kadono, Kohji; and Tsunoda, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle body frame for motorcycles. 4,691,800, Cl. 180-219.000.

Kadowaki, Takashi: *See*—
Sasaki, Masao; Kadowaki, Takashi; and Onodera, Kaoru, 4,692,399, Cl. 430-507.000.

Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., to RCA Corporation. Method of forming a dielectric film and semiconductor device including said film. 4,692,344, Cl. 427-39.000.

Kagiyama, Tsutomu: *See*—
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Kainaga, Masahiro: *See*—
Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.

Kaiser, Donald B.: *See*—
Miller, Louis D.; and Kaiser, Donald B., 4,692,658, Cl. 313-365.000.

Kaiya, Atsushi: *See*—
Hayakawa, Masaru; Yoshida, Takeshi; and Kaiya, Atsushi, 4,691,759, Cl. 164-526.000.

Kale, Hemant D. Compartmentalized electric liquid heater. 4,692,592, Cl. 219-298.000.

Kamatsu, Yasutoshi: *See*—
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Kamigaito, Osami: *See*—
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

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Kamyr AB: *See*—
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Kanai, Mitsuharu: *See*—
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

Kane, James, to Cordis Corporation. Optical pressure sensor for measuring blood pressure. 4,691,708, Cl. 128-667.000.

Kane, Patrick J., to Creative Metal Designs Ltd. Interlocking roof tile. 4,691,492, Cl. 52-519.000.

Kaneda, Naoya: *See*—
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
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Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Method for producing a

semiconductor laser device having a buried heterostructure. 4,692,206, Cl. 156-649.000.

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Kaneko, Shigeru: *See*—
Kiriu, Yoshio; Kaneko, Shigeru; and Kosuge, Hiroshi, 4,692,922, Cl. 371-37.000.

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Kania, Charles M.: *See*—
Das, Suryya K.; and Kania, Charles M., 4,692,503, Cl. 526-301.000.

Kankyo Souken Consultant, Co., Ltd.: *See*—
Maeda, Isamu, 4,691,900, Cl. 266-156.000.

Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, to Aisin Seiki Kabushiki Kaisha. Intra-aortic balloon pump apparatus and method of using same. 4,692,148, Cl. 604-96.000.

Kao, David T., to University of Kentucky, Board of Trustees of the. Self-flushing fluid seal assembly. 4,691,620, Cl. 92-80.000.

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Karasaki, Koichi: *See*—
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC

Karatson, Laszlo : *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Kartridg Pak Co., The: *See*—
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Kasahara, Yasushi: *See*—
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Kasai, Naomi, to Nippon Thompson Co., Ltd. Roller bearing for an infinite rectilinear motion. 4,692,037, Cl. 384-44.000.

Kasai, Naomi, to Nippon Thompson Co., Ltd. Linear motion rolling contact bearing assembly having a load dependent variable resistance. 4,692,038, Cl. 384-45.000.

Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, to Kyowa Hakko Kogyo Kabushiki Kaisha. Substance K-259-2 and a process for producing the same. 4,692,310, Cl. 424-122.000.

Katakura, Kageyoshi: *See*—
Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,653, Cl. 310-334.000.
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.

Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, to Minolta Camera Kabushiki Kaisha. Depth-of-field preview apparatus for a single lens reflex camera. 4,692,010, Cl. 354-273.000.

Katernberg, Helmut; and Kohler, Ingolf, to M.A.N.Maschinenfabrik Augsburg-Nurnberg. Floating dock construction. 4,691,656, Cl. 114-45.000.

Katner, Allen S., to Eli Lilly and Company. 3-bicyclicpyridiniummethyl cephalosporins. 4,692,443, Cl. 514-206.000.

Kato, Kaoru: *See*—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Kato, Shunichi: *See*—
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Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.

Katsura, Yousuke: *See*—
Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, 4,692,444, Cl. 514-406.000.

Kauffman, John C., to Phelps Dodge Industries, Inc. Ribbon cable. 4,692,566, Cl. 174-117.0FF.

Kaufman, Vernan R.: *See*—
Geringer, Miles S.; and Kaufman, Vernan R., 4,691,590, Cl. 74-579.00E.

Kaufman, Yaacov. Joint and method of utilizing it. 4,692,050, Cl. 403-3.000.

Kaule, Wittich: *See*—
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Kawada, Susumu: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Kawaguchi, Yoshifumi, to Nippon Thompson Co., Ltd. Roller bearing for endless linear motion. 4,692,036, Cl. 384-44.000.

Kawahara, Atsushi; and Okita, Masaya, to Nippon Kogaku K.K. Photographing and recording method and apparatus for electronic still picture cameras. 4,692,815, Cl. 358-335.000.

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Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, 4,691,526, Cl. 62-217.000.

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Kawamoto, Isao: *See*—
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Kawamura Electric Industry Co., Ltd.: *See*—
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Kawamura, Youji: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Kawano, Tetsuo: *See*—
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Kawata, Koichi: *See*—
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Kee, Richard C., to Polaroid Corporation. Electronic camera handle configuration. 4,692,807, Cl. 358-229.000.

Keeler, Brian G.; and Whitley, George J., to RCA Corporation. Robot end effector for processing component leads. 4,691,419, Cl. 29-39.000.

Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. Cyclohexenone derivatives and their use for controlling undesirable plant growth. 4,692,553, Cl. 564-185.000.

Kelly, Kevin P.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.

Kelly, Renee J., to Du Pont de Nemours, E. I., and Company. Process for matching color of paint to a colored surface. 4,692,481, Cl. 523-219.000.

Kelly, Thomas P.: *See*—
Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., 4,691,404, Cl. 15-167.00R.

Kelsey, John R. Valve seat grinding apparatus. 4,691,480, Cl. 51-241.00A.

Kendall Company, The: *See*—
Cianci, James P.; and Gross, James R., 4,692,150, Cl. 604-111.000.
Dunn, William J.; and Silver, Brian H., 4,691,557, Cl. 73-32.00A.
Huddleston, Elwyn G., 4,692,352, Cl. 427-208.400.
Rosenberg, Helmut W. G.; and Drach, George W., 4,692,149, Cl. 604-99.000.

Kennedy, Michael, to Brother Albert Welsh Foundation. Ventilator including a double pass countercurrent heat exchanger. 4,691,763, Cl. 165-54.000.

Kerr, Jack R.; Shelton, Thomas V.; and Dunsmore, Jerry L. Self-locking nut with rocking anti-reversing pin. 4,692,077, Cl. 411-206.000.

Kerttula, Reima, to Valmet Oy. Apparatus for conveying a web lead-in strip in a paper machine. 4,692,215, Cl. 162-289.000.

Kervagoret, Gilbert, to Bendix France. Regulated device for controlling flow in a hydraulic installation, particularly for the assisted steering of a vehicle. 4,691,619, Cl. 91-459.000.

Kessler, Gerald. Drain tube for windows. 4,691,487, Cl. 52-209.000.

Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, to Mobil Oil Corporation. Heat sealable film and method for its preparation. 4,692,379, Cl. 428-349.000.

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Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Khoe, Giok D.; and De Vrieze, Henricus M., to U.S. Philips Corporation. Method of manufacturing a light-emitting device. 4,692,208, Cl. 156-659.100.

Khuri-Yakub, Pierre: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Kiefel, Bernhard: *See*—
Hoppner, Klaus; and Kiefel, Bernhard, 4,691,681, Cl. 123-556.000.

Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. Isoureas and their use for controlling undesirable plant growth. 4,692,187, Cl. 71-107.000.

Kieninger, Walter, to Walter Kieninger GmbH. Cutter head. 4,692,069, Cl. 407-39.000.

Kijima, Masatsugu: *See*—
Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, 4,692,924, Cl. 372-30.000.

Kikuchi, Kazuhiro, to Nissan Motor Company, Limited. Apparatus for throttle valve control. 4,691,676, Cl. 123-399.000.

Killian, Edmund F.; and Berliner, Wallace H., to Waldes Truarc Inc. Bowed internal spring retaining ring that functions regardless of its orientation when installed in a groove. 4,692,079, Cl. 411-353.000.

Kim, Jai B.; and Yadlosky, John M. Rehabilitation of steel truss bridges by means of reinforcing arches. 4,691,399, Cl. 14-2.000.

Kimball, Philip M., to Polaroid Corporation. Drop dispensing device and method for its manufacture. 4,692,776, Cl. 346-140.00R.

Kimberly-Clark Corporation: *See*—
Morman, Michael T.; and Wisneski, Tony J., 4,692,371, Cl. 428-224.000.
Taylor, Jack D.; and Collier, L. Warren, IV, 4,692,368, Cl. 428-137.000.
Kimura, Hiroshi: *See*—
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.
Kimura, Kazuaki: *See*—
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Kimura, Kazuhiko: *See*—
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.
Kimura, Seiichiro; and Aoki, Hidekazu, to Kabushiki Kaisha Toshiba. Surface heat treating apparatus. 4,692,583, Cl. 219-121.00L.
Kinanen, Ilmari; and Ranne, Sulo, to Orion-yhtyma Oy. Planetary transmission based on friction. 4,691,595, Cl. 74-798.000.
Kinetics Technology International Corporation: *See*—
Minet, Ronald G.; and Warren, David, 4,692,306, Cl. 422-49.000.
King, Arthur S. Apparatus for increasing the residence time of waste liquids in an electric treater. 4,692,232, Cl. 204-278.000.
King, Ethmer W.; Kircher, Robert C., Jr.; and Yotsuuye, David S., to Boeing Company, The. Aircraft navigational systems and methods for creating navigational guidepoints. 4,692,869, Cl. 364-448.000.
King, Martin J.: *See*—
Troutner, Vernon H.; and King, Martin J., 4,692,138, Cl. 604-4.000.
King Plastics, Inc.: *See*—
King, Robert F., 4,691,501, Cl. 53-485.000.
King, Robert F., to King Plastics, Inc. Method of feeding and applying ridged container closures. 4,691,501, Cl. 53-485.000.
Kinglor-LTD: *See*—
Cavigli, Mario; and Ferrari, Lorenzo, 4,692,929, Cl. 373-89.000.
Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, to Konishiroku Photo Industry Co., Ltd. Photoreceptor having a photosensitive layer containing an azo compound. 4,692,393, Cl. 430-59.000.
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, to Tokyo Juki Industrial Co., Ltd. Input device for sewing machine. 4,692,871, Cl. 364-470.000.
Kinugawa, Kiyoshi: *See*—
Washizuka, Isamu; and Kinugawa, Kiyoshi, 4,692,740, Cl. 340-365.00R.
Kinzer, Norbert: *See*—
Sauerwein, Kurt; Kinzer, Norbert; and Mick, Felix W., 4,692,628, Cl. 250-497.100.
Kirby, Charles A., to Northwest Design Products, Inc. Connector system for structural framework. 4,692,054, Cl. 403-171.000.
Kircher, Robert C., Jr.: *See*—
King, Ethmer W.; Kircher, Robert C., Jr.; and Yotsuuye, David S., 4,692,869, Cl. 364-448.000.
Kiriu, Yoshio; Kaneko, Shigeru; and Kosuge, Hiroshi, to Hitachi, Ltd. Method for correcting and detecting errors. 4,692,922, Cl. 371-37.000.
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, to Hoechst Aktiengesellschaft. Process for the manufacture of 3-pyridinium-methyl-cephalosporins. 4,692,516, Cl. 540-222.000.
Kirschmann, John D.; and Soberg, John P. Chemical dispensing system. 4,691,850, Cl. 222-642.000.
Kishi, Hajimu; and Tanaka, Kunio, to Fanuc Ltd. Machine tool pick feed method. 4,692,873, Cl. 364-474.000.
Kishi, Mitsuihiro, to Kabushiki Kaisha Hikoma Seisakucho. Lifting apparatus. 4,691,805, Cl. 187-9.00R.
Kiss, Nandor: *See*—
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Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, to Tanabe Seiyaku Co., Ltd. Method for producing L-aspartic acid. 4,692,409, Cl. 435-109.000.
Kitahara, Kohei: *See*—
Nakagawa, Hitoshi; and Kitahara, Kohei, 4,691,911, Cl. 271-9.000.
Kitahara, Toshihiro: *See*—
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Kitamura, Hideaki: *See*—
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Kitchell, Judith P.; and de Riel, Stanton R., to Dynatech Corporation. Biologically useful polymer preparations. 4,692,328, Cl. 424-78.000.
Kito, Masahiro; and Mori, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Heat exchanger. 4,691,761, Cl. 165-32.000.
Kiuchi, Masayoshi, to Canon Kabushiki Kaisha. Display device for camera. 4,692,014, Cl. 354-471.000.
Kiuchi, Masayoshi: *See*—
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.
Kiya, Nobuyuki, to Fanuc LTD. Numerical control system with plural groups of miscellaneous functions. 4,692,872, Cl. 364-474.000.
Klargester Environmental Engineering Ltd.: *See*—
Nicholson, John L., 4,692,241, Cl. 210-150.000.
Klatt, Robert W., to Hughes Aircraft Company. Detector signal conditioner. 4,692,618, Cl. 250-330.000.
Klein, Robert W.; and Foxx, Mary E., to William H. Rorer, Inc. Erythromycin/benzoyl peroxide antiacne compositions. 4,692,329, Cl. 424-81.000.
Klemm, Theobald: *See*—
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Klimacek, Dusan: *See*—
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Klocker, Peter: *See*—
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Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr: *See*—
Glunk, Josef, 4,691,504, Cl. 56-192.000.
Kluttermann, Jurgen; and Trutzschler, Hermann, to Trutzschler GmbH & Co. KG. Sliver coiler. 4,691,413, Cl. 19-159.00R.
Kluttermann, Jurgen, to Trutzschler GmbH & Co. KG. Sliver coiler drive. 4,691,414, Cl. 19-159.00R.
Klygis, Mindaugas J., to Illinois Tool Works Inc. Foldable container carrier collapsible container carrier with cruciform handle. 4,691,860, Cl. 229-52.00A.
Kmiec, Chester J.; and Novits, Michael F., to Pennwalt Corporation. Gas-releasing composition for tailoring gas evolution of system. 4,692,269, Cl. 252-350.000.
Knape & Vogt Manufacturing Co.: *See*—
Bessinger, Walter L., 4,691,887, Cl. 248-250.000.
Knoerzer, Karl-Heinz. Rotating collector assembly for electrical machines. 4,692,648, Cl. 310-233.000.
Knofel, Hartmut: *See*—
Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, 4,692,550, Cl. 560-345.000.
Knoll, Gunter: *See*—
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Koba, Yoshinori, to Meinan Machinery Works, Inc. Apparatus for dehydrating crude veneer. 4,691,629, Cl. 100-121.000.
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, to Kabushiki Kaisha Riken; and Aisin Seiki Kabushiki Kaisha. Rod seal device for stirling engines. 4,691,591, Cl. 74-606.00A.
Kobayashi, Fumio: *See*—
Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, 4,691,584, Cl. 74-471.00R.
Kobayashi, Hiroshi: *See*—
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Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Air conditioning unit for vehicle. 4,691,526, Cl. 62-217.000.
Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, to Ise Electronics Corporation. Fluorescent display tube for light source. 4,692,663, Cl. 313-495.000.
Kobayashi, Masamichi: *See*—
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Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, to Hitachi, Ltd. Optical waveguide and method for making the same. 4,691,983, Cl. 350-96.120.
Kobishi Electric Co., Ltd.: *See*—
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Koch, Magnus: *See*—
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Kochloefl, Karl: *See*—
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Koehler, Gerard, to La Telemecanique Electrique. Direct current electromagnet having a movement of translation. 4,692,729, Cl. 335-259.000.
Kofoed, Bruce O. Sheet gripper tongs. 4,691,953, Cl. 294-19.100.
Kogashiwa, Kiyonori: *See*—
Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, 4,692,132, Cl. 493-103.000.
Kohl, Jerry. Decorative plaque with replaceable decorative element. 4,691,460, Cl. 40-618.000.
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Koht, Lowell; and Shimirak, Gerald L., to Raychem Corporation. Segmented end seal and closure. 4,692,565, Cl. 174-93.000.
Kohuth, Russell T.: *See*—
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Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, to Tokyo Kagaku Kakai Kabushiki Kaisha. Laser treatment apparatus. 4,692,924, Cl. 372-30.000.
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Kokura, Satoshi: *See*—
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
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Kollmeier, Hans-Joachim; and Lammerting, Helmut, to Th. Goldschmidt AG. Process for the manufacture of molded objects. 4,692,292, Cl. 264-126.000.
Komada, Hideaki: *See*—
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Komatsu, Shigeru, to Kabushiki Kaisha Toshiba. Trimming of metal interconnection layer by selective migration of metal atoms by energy beams. 4,692,190, Cl. 437-189.000.
Komatsubara, Saburo: *See*—
Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, 4,692,409, Cl. 435-109.000.
Komiya, Hidetsugu, to Fanuc Ltd. Position control of multiple tools based on elapsed time of tool operation. 4,692,856, Cl. 364-167.000.
Komoda, Tsutomu: *See*—
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Komulainen, Viljo S., to Aihiko Ky. Method for sawing a tree trunk and for treating a uniformly thick slice of wood sawed off the trunk. 4,691,751, Cl. 144-357.000.
Komura, Makoto: *See*—
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.
Kondo, Hirokazu: *See*—
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Konig, Klaus: *See*—
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Konishi, Masanori: *See*—
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Kenichi, to Bristol-Myers Company. Peptide antibiotics. 4,692,510, Cl. 530-317.000.
Konishi, Yozo: *See*—
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Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, 4,692,400, Cl. 430-553.000.
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.
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Konstantinov, Boris A.: *See*—
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Konstructa Trencin, narodny podnik: *See*—
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Konuma, Toshimitsu: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.
Kosaka, Etsuji: *See*—
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Kosuge, Hiroshi: *See*—
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Kosuge, Shuichi, to Nippondenso Co., Ltd. Automatic shift control system. 4,692,866, Cl. 364-424.100.
Kosugi, Kenichi: *See*—
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Kotitschke, Herbert: *See*—
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Kovac, Andrew J. Amphibious vehicle. 4,691,657, Cl. 114-61.000.
Kowa Company Ltd.: *See*—
Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, 4,692,012, Cl. 354-403.000.
Kowalski, Slawomir, to Marotta Scientific Controls, Inc. Valve for fire suppression. 4,691,736, Cl. 137-557.000.
Koya, Shinichi: *See*—
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Koyama, Tatsuya: *See*—
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Koyanagi, Kaoru: *See*—
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Kozlowski, Eric F.; and Kruger, Edmund R., to Lear Siegler, Inc. Method and apparatus for bonding fabric to a foam pad. 4,692,199, Cl. 156-245.000.
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Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, 4,692,914, Cl. 369-49.000.
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Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.
Krasselt, Mansfred M.: *See*—
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Kratzsch, Eberhard; Cygan, Wolfgang; and Kiss, Nandor, to Akzona Incorporated. Use of air-jet textured yarns in the manufacturing of abrasives on substrates. 4,692,365, Cl. 428-87.000.
Krause, Manfred: *See*—
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Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, to Bayer Aktiengesellschaft. Thermoplastic polycarbonate moulding compositions. 4,692,488, Cl. 524-139.000.
Kretchmer, Richard A.: *See*—
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Kristal Instrumente AG: *See*—
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.
Kritzler, Steven, to Field Group Chemicals Pty. Ltd. Radiopaque medium. 4,692,325, Cl. 424-4.000.
Krohn, Duane D.; and Boogerman, Allan, to Graco Inc. Pressure Roller Applicator. 4,692,048, Cl. 401-197.000.
Krufka, Frank S., to RCA Corporation. System for fine focusing a camera on a moving curved surface. 4,692,605, Cl. 250-201.000.
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Kubota, Ltd.: *See*—
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Kucera, Clare H., to Dowell Schlumberger Incorporated. Fracturing of subterranean formations. 4,692,254, Cl. 252-8.551.

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Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., to Rorer Pharmaceutical Corporation. Bicyclic benzenoid aminoalkylene ethers and thioethers, pharmaceutical compositions and use. 4,692,445, Cl. 514-212.000.
Kulinyak, Ernst, to Messerschmitt-Bolkow-Blohm GmbH. Rotary positionable installation. 4,692,094, Cl. 416-11.000.
Kumakura, Koichi; and Hosokawa, Yoshinori, to Horiba, Ltd. Apparatus for detecting amount of liquid nitrogen. 4,691,793, Cl. 177-50.000.
Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, to Horiba, Ltd. Automatic steel analysis apparatus. 4,692,935, Cl. 378-49.000.
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory. 4,692,901, Cl. 365-201.000.
Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,692,400, Cl. 430-553.000.
Kumatani, Hiroshi; and Yamaura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Lever mechanism in combination with a sewing machine driving device. 4,691,588, Cl. 74-512.000.
Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, to Nihon Tokushu Noyaku Seizo K.K. Phosphoroimidates as pesticides. 4,692,436, Cl. 514-129.000.
Kuo, Dai-Ming. Toilet having wire-adjusted water-spray nozzles. 4,691,391, Cl. 4-447.000.
Kurihara, Kazumasa, to Nifco Inc. Device for holding rod-like objects. 4,691,883, Cl. 248-74.200.
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Kuriyama, Minoru; and Yamamoto, Tadashi, to Ube Industries. Degassing apparatus for a metal mold. 4,691,755, Cl. 164-305.000.
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Kuroiwa, Akihiko; and Saito, Suzuo, to Kabushiki Kaisha Toshiba. Constant voltage and frequency type PWM inverter with minimum output distortion. 4,692,855, Cl. 363-95.000.
Kuroki, Katsuro: *See*—
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Kurosawa, Toshiharu: *See*—
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Kusaka, Masaharu: *See*—
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Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, to Hitachi, Ltd. Acoustic transducers utilizing ZnO thin film. 4,692,653, Cl. 310-334.000.
Kuwabara, Hideki: *See*—
Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, 4,692,507, Cl. 528-481.000.
Kuwabara, Kiyoshi: *See*—
Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, 4,692,843, Cl. 361-414.000.
Kuzemchak, James J. Ostomy pouch flush nozzle. 4,692,159, Cl. 604-277.000.
Kwong, Ranee W.: *See*—
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.
Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.
L-Bar Products Incorporated: *See*—
Roman, Ronald J., 4,692,259, Cl. 252-70.000.
La Telemecanique Electrique: *See*—
Joly, Jean; and Oehlert, Yves, 4,692,842, Cl. 361-413.000.
Koehler, Gerard, 4,692,729, Cl. 335-259.000.
LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, to Optech Inc. Controlled color light source. 4,692,607, Cl. 250-205.000.
Lackinger, Franz, to Westward Investments Limited. Cable gland embodying moisture-proof seal. 4,692,563, Cl. 174-65.0SS.
Lacy, Sylvia M.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.
LaFrance Corporation: *See*—
Peroni, Peter A., 4,691,457, Cl. 40-20.00A.
Lai, John T.: *See*—
Son, Pyong-Nae; and Lai, John T., 4,692,487, Cl. 524-100.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Marhic, Gerard, 4,692,582, Cl. 219-121.0PT.
Laitram Corp., The: *See*—
Weber, Peter G., 4,691,818, Cl. 197-666.000.
Lakin, David F., to Lucas Limited public limited company. Fuel injection pumping apparatus. 4,691,679, Cl. 123-450.000.
Lalin, Hill S.; Bermudez, Jorge E.; and Fleming, William T. Soap film gas flowmeter. 4,691,577, Cl. 73-861.050.
Lalmond, Richard G., to Sanders Associates, Inc. Optical power distribution system. 4,692,683, Cl. 322-2.00R.
Lamb, Timothy K. Current killer, swift water floater. 4,691,466, Cl. 43-43.130.
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Kollmeier, Hans-Joachim; and Lammerting, Helmut, 4,692,292, Cl. 264-126.000.
Lampert, Ingolf; and Jacob, Herbert, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for polishing silicon wafers. 4,692,223, Cl. 204-34.500.
Lan, Charng-Ching. Pen with selective multi-color cores. 4,692,046, Cl. 401-32.000.
Lancaster, William G., to Lantech, Inc. Film lamination stretch wrapping. 4,691,497, Cl. 53-399.000.
Lance, Jacques; and Muller, Georges, to Commissariat a l'Energie Atomique. Method and apparatus for replacing a filter in a vessel. 4,691,425, Cl. 29-402.080.
Landau, Boris; and Saines, Marius, to Ergomed. Squeeze-actuated syringe with position-selectable lock. 4,692,157, Cl. 604-214.000.
Landell, Harper; and Woolworth, Richard G., to Woodstream Corporation. Lighted tackle box. 4,691,470, Cl. 43-55.000.
Landrau, Felix A.: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,692,336, Cl. 424-468.000.
Landrevie, Bernard: *See*—
Godfrin, Jean-Philippe; Landrevie, Bernard; and Escache, Gerard, 4,691,633, Cl. 102-202.000.
Lane, Kerry S.; and Moore, Derek V., to Levitt Safety Limited. Nicad battery charger. 4,692,682, Cl. 320-35.000.
Lang, Gerard: *See*—
Junino, Alex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, 4,692,166, Cl. 8-410.000.
Lang, Marc: *See*—
Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.
Lang, Robert W., to Ciba-Geigy Corporation. Process for the preparation of hemiaminals, and the use thereof. 4,692,536, Cl. 556-413.000.
Langer, Hans J.: *See*—
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.
Lantech, Inc.: *See*—
Lancaster, William G., 4,691,497, Cl. 53-399.000.
Larsen, Anders, to Nord-Plan Stalreoler A/S. Thin plate structure. 4,691,493, Cl. 52-588.000.
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., to Fyrnetics, Inc. Weight scales and strain gauge assemblies useable therein. 4,691,794, Cl. 177-211.000.
Larson, Harold V.; and Gillman, Hyman D., to Atlantic Richfield Company. Purification of propylene oxide. 4,692,535, Cl. 549-542.000.
Larsson, Klas G. I.; Lindholm, Rolf C.; and Strom, Johan P., to U.S. Philips Corporation. Arrangement for fire control. 4,691,616, Cl. 89-41.070.
Lasarray Holding AG: *See*—
Percival, Richard; and Uhlmann, Ernst, 4,691,434, Cl. 437-173.000.
Lattrell, Rudolf: *See*—
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.
Lauderbach, Leo, to Stabilus GmbH. Taper connection on a chair or table column of adjustable height. 4,692,057, Cl. 403-334.000.
Lavendel, Henry W.; and Robinson, John C., to Lockheed Missiles & Space Company, Inc. Laminated article. 4,692,388, Cl. 428-621.000.
LaVene, Leon F.: *See*—
DeLand, Daniel L.; and LaVene, Leon F., 4,691,943, Cl. 285-315.000.
Lavoine, Jean-Claude: *See*—
Andrieux, Alain; Trequilly, Yves; and Lavoine, Jean-Claude, 4,692,841, Cl. 361-395.000.
Lawrance, George F. Display stand. 4,691,885, Cl. 248-165.000.
Lawrence, Dale M.: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,691,703, Cl. 128-303.100.
Lawrence, Frederick J., to Gradco Systems, Inc. Sheet receiver. 4,691,914, Cl. 271-297.000.
Lawrence, Katherine, to Hewlett-Packard Company. Novel gel compositions, processes for making same and uses in transmitting and measuring electrical impulses. 4,692,273, Cl. 252-518.000.
Lawson-Tancred, Henry, to Sir Henry Lawson-Tancred, Sons & Co. Ltd. Wind turbine blades. 4,692,095, Cl. 416-23.000.
Lawton, Geoffrey: *See*—
Hassall, Cedric H.; Lawton, Geoffrey; and Redshaw, Sally, 4,692,438, Cl. 514-183.090.

Layden, David L.: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.
Leader Company Limited: *See*—
Kadogawa, Kouji; and Watanabe, Tsunenori, 4,691,398, Cl. 12-77.000.
Lear Siegler, Inc.: *See*—
Kozlowski, Eric F.; and Kruger, Edmund R., 4,692,199, Cl. 156-245.000.
Lease, Michael E.: *See*—
Risser, Dale M.; and Lease, Michael E., 4,691,410, Cl. 17-11.000.
Leathers, Thomas M.: *See*—
Portolese, Larry A.; and Leathers, Thomas M., 4,691,730, Cl. 137-101.000.
Leaver, James M. Cementitious modular panel and panel assembly for building walls and method of construction. 4,691,490, Cl. 52-293.000.
Leclaire, Charly, to Prouvost S.A. Method and sewing machine for automatically providing end of stitching at a given distance from the edge of a piece of fabric. 4,691,652, Cl. 112-262.100.
Lederle (Japan), Ltd.: *See*—
Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, 4,692,519, Cl. 540-227.000.
LeDoux, John P. Lamp for temporarily attaching to a support. 4,692,850, Cl. 362-432.000.
Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, to Digital Equipment Corporation. Multiple chip interconnection system and package. 4,692,839, Cl. 361-386.000.
Lee, Kyong H.: *See*—
Gard, Michael F.; Warmack, Ralph E.; Lee, Kyong H.; and Maschhoff, Robert H., 4,692,909, Cl. 367-45.000.
Lee, Len F., to Monsanto Company. 2,6-substituted pyridine compounds. 4,692,184, Cl. 71-94.000.
Lee, Robert E. Closed loop servo control system. 4,692,678, Cl. 318-687.000.
Lee, Sam H.: *See*—
Fang, Sheng; and Lee, Sam H., 4,692,634, Cl. 307-272.100.
Leeper, Alan L., to International Shoe Machine Corporation. Method and machine to form box parts. 4,692,133, Cl. 493-128.000.
Leffel, Leon E.; and Leffel, Rick G. Nonsymmetrical compensator for handgun. 4,691,614, Cl. 89-14.300.
Leffel, Rick G.: *See*—
Leffel, Leon E.; and Leffel, Rick G., 4,691,614, Cl. 89-14.300.
Lefler, Jerrold P.: *See*—
Cuff, William A.; and Lefler, Jerrold P., 4,692,042, Cl. 400-94.000.
Leigh, John W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Modular ground mine. 4,691,637, Cl. 102-406.000.
Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, to BASF Aktiengesellschaft. 2-amino-3,5-di-(halomethyl)-pyrazines and their preparation. 4,692,527, Cl. 544-405.000.
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, to Adeka Argus Chemical Co., Ltd. Vinyl benzyl 2,2,6,6-tetramethyl piperidines. 4,692,485, Cl. 524-99.000.
Le Marchand, Claude; and Gerard, Jean-Louis, to Bendix France. Disc brake with automatic adjustment. 4,691,809, Cl. 188-71.900.
Lemke, Otto; and Krause, Manfred, to Carl Still GmbH & Co. KG, Firma. Readjustment device for coke oven batteries. 4,692,217, Cl. 202-151.000.
Lemmer, Helmut, to Square D Starkstrom GmbH. Circuit breaker, in particular an accessory or motor contactor. 4,691,978, Cl. 439-620.000.
Lenk, Erich: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., to General Electric Company. Fluid cooled acyclic generator rotor having a copper conductor diffusion bonded to a magnetic steel core. 4,692,644, Cl. 310-178.000.
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, to Regie Nationale des Usines Renault. Control system for a four-speed automatic transmission. 4,691,597, Cl. 74-869.000.
LeRoux, Donald F.; and Stottlemyer, Quayton R., to Du Pont de Nemours, E. I., and Company. Method and apparatus for air jet assisted film unloading from x-ray cassettes. 4,692,083, Cl. 414-411.000.
Leroy, Andre . Roller displacement motor. 4,692,105, Cl. 418-184.000.
Lerschen, James R.: *See*—
DeKezel, James A.; and Lerschen, James R., 4,691,463, Cl. 43-3.000.
Leung, Wing K.: *See*—
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.
Leupold, Ernst I.: *See*—
Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, 4,692,547, Cl. 560-186.000.
Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, to United States of America, Army. Remanence varying in a leakage free permanent magnet field source. 4,692,732, Cl. 335-302.000.
Le Van Mao, Raymond, to Asbestos Institute, The. Dry impregnated manganese zeolite. 4,692,424, Cl. 502-68.000.
Le Vantine, Allan D. Heat free examination light with fully rotatable head and arm. 4,692,849, Cl. 362-402.000.
Levasseur, Jean-Pierre, to Omnium de Traitements et de Valorisation (O.T.V.). Apparatus for processing solid wastes to produce a fuel. 4,692,167, Cl. 44-2.000.
Lever Brothers Company: *See*—
Secemski, Isaac I.; and Lynn, Jesse L., Jr., 4,692,275, Cl. 252-534.000.
Levitt Safety Limited: *See*—
Lane, Kerry S.; and Moore, Derek V., 4,692,682, Cl. 320-35.000.
Lewiner, Jacques; and Hennion, Claude. Remote control coded devices. 4,692,762, Cl. 340-825.690.
Lewis, Robert T., to Tribometrics, Inc. Method and device including a bed of ferromagnetic fibers and magnetic flux sensor for measuring the amount of magnetic particles on a liquid. 4,692,698, Cl. 324-204.000.
L'Heureux, Arthur J., III: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.
Licata, William H.: *See*—
Politis, Demetrios T.; and Licata, William H., 4,692,765, Cl. 342-106.000.
Licentia Patent-Verwaltungs-GmbH: *See*—
Frank, Werner, 4,691,913, Cl. 271-34.000.
Gillmann, Hanno, 4,691,912, Cl. 271-10.000.
Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, 4,692,926, Cl. 372-46.000.
Ostwald, Robert; and Voit, Gabriele, 4,692,356, Cl. 427-304.000.
Licinvest AG: *See*—
Ackeret, Peter, 4,691,456, Cl. 40-10.00R.
Lietz, Larry D.: *See*—
Austin, George K., Jr.; and Lietz, Larry D., 4,691,948, Cl. 292-171.000.
Life Support Systems, Inc.: *See*—
Elkins, William; Connell, Eugene W.; and Short, Robert E., 4,691,762, Cl. 165-46.000.
Lilley, Raymond A., to Cladcolor Profiling Limited. Support systems. 4,691,491, Cl. 52-481.000.
Lim, Gnian C., to Amada Engineering & Service Co., Inc. Gaseous discharge device. 4,692,664, Cl. 315-60.000.
Lin, Min-Shin. Clamping apparatus for hammering a hardened nail. 4,691,598, Cl. 81-44.000.
Lin, Weng-Pin; and Chang, Nelson. Reflector for a spoked wheel. 4,691,992, Cl. 350-99.000.
Lindel, Hans: *See*—
Hallenbach, Werner; Lindel, Hans; and Brandes, Wilhelm, 4,692,461, Cl. 514-443.000.
Lindenfelser, Timothy M. Semi-conductor device with sandwich passivation coating. 4,692,786, Cl. 357-54.000.
Lindholm, Rolf C.: *See*—
Larsson, Klas G. I.; Lindholm, Rolf C.; and Strom, Johan P., 4,691,616, Cl. 89-41.070.
Lindner, Christian: *See*—
Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.
Lindner, Luther E.; and Wechter, Stephen R., to Texas A&M University System, The. Methods and compositions for the detection of acquired immune deficiency syndrome. 4,692,403, Cl. 435-5.000.
Lindorfer, Walter; and Jahn-Held, Wilhelm, to Wintershall AG. Process for dumping of particulate solid waste materials in underground salt enclosed cavitives. 4,692,061, Cl. 405-128.000.
Lindquist, Wayne V.: *See*—
Elliott, Roger A.; and Lindquist, Wayne V., 4,692,918, Cl. 370-85.000.
Lins, Stanley J.: *See*—
Lo, David S.; and Lins, Stanley J., 4,692,899, Cl. 365-29.000.
Lion's Sports, Inc.: *See*—
Lopez, Lionel P., 4,691,387, Cl. 2-161.00A.
Lips, Hendrik: *See*—
Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, 4,691,636, Cl. 102-387.000.
Littmann, Wolfgang: *See*—
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Liu, Kou-Chang, to GAF Corporation. Preparation of carboxypropylated non-ionic surfactants. 4,692,551, Cl. 562-471.000.
Liu, Shuchen, to American Hoechst Corporation. Process for developing an aqueous alkaline development diazo photographic element. 4,692,397, Cl. 430-325.000.
Livingston, Afton M.: *See*—
Livingston, Virginia W.; Alexander-Jackson, Eleanor G.; and Livingston, Afton M., 4,692,412, Cl. 435-253.000.
Livingston, Virginia W.; Alexander-Jackson, Eleanor G.; and Livingston, Afton M. Method of preparing an autogenous vaccine. 4,692,412, Cl. 435-253.000.
Llort, Francisco M.: *See*—
Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., 4,692,497, Cl. 525-263.000.
Lloyd, Adam J. P.: *See*—
Gupta, Alankar; and Lloyd, Adam J. P., 4,691,760, Cl. 165-26.000.
Lo, David S.; and Lins, Stanley J., to Sperry Corporation. Propagational control for Vertical Bloch Line memories. 4,692,899, Cl. 365-29.000.
Loce, Robert P.; Rees, James D.; and Durbin, John A., to Xerox Corporation. Short focal lens array with multi-magnification properties. 4,692,015, Cl. 355-1.000.

Locke, Stanley; and Gouilloud, Michel, to Schlumberger Technology Corporation. Method and apparatus for measuring the earth formation resistivity of a plurality of radial regions around a borehole. 4,692,707, Cl. 324-374.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Lavendel, Henry W.; and Robinson, John C., 4,692,388, Cl. 428-621.000.

Lohrengel, Gregor, to Huls Aktiengesellschaft. Method of concentrating polyphenylene ether solutions. 4,692,482, Cl. 523-340.000.

Lombardini, Lapo; and Bardi, Gianluca, to Officine Galileo S.p.A. Cryogenic pump with refrigerator with the geometry of the shields, suitable for achieving a high efficiency and an extended life. 4,691,534, Cl. 62-55.500.

Longhouse, Richard E.: *See*—
Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., 4,692,098, Cl. 416-223.00R.

Lonza Ltd.: *See*—
Tenud, Leander; and Gosteli, Jacques, 4,692,543, Cl. 558-342.000.

Lopez, Carlos; and Serrano, Jose L., to Piher Navarra, S.A. Devices used for varying the resistance of electrical circuits and the conduction of current in electrical circuits. 4,692,805, Cl. 338-198.000.

Lopez, Lionel P., to Lion's Sports, Inc. Glove apparatus. 4,691,387, Cl. 2-161.00A.

Loral Corporation: *See*—
Reichel, Paul, deceased; and Reichel, Gilbert, administrator, 4,692,722, Cl. 333-142.000.

Lord, Gary E., to Eli Lilly and Company. Crystalline (7R)-7-amino-3-(1'-pyridiniummethyl)-3-cephem-4-carboxylate monohydrate compound. 4,692,518, Cl. 540-224.000.

"L'Oreal" : *See*—
Herb, Armin, 4,692,076, Cl. 411-55.000.
Junino, Alex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, 4,692,166, Cl. 8-410.000.

Lorg, John W. Infiltration control device. 4,691,478, Cl. 49-499.000.

Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, to Choay, S.A. Mucopolysaccharide composition having a regulatory action on coagulation, medicament containing same and process of preparation. 4,692,435, Cl. 514-56.000.

Los, Vladimir F.: *See*—
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

Losert, Wolfgang: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Loughlin, John J.: *See*—
Dickens, Judith F.; and Loughlin, John J., 4,691,710, Cl. 128-673.000.

LRC Electronics, Inc.: *See*—
Cowen, Judith A., 4,691,976, Cl. 439-394.000.

LTM Corporation of America: *See*—
Galerne, Jean, 4,692,844, Cl. 362-3.000.

Lucas Electrical Electronics and Systems Limited: *See*—
West, John G. W., 4,691,668, Cl. 123-41.120.

Lucas Industries public limited company: *See*—
Greeves, Godfrey, 4,691,864, Cl. 239-453.000.

Lucas Limited public limited company: *See*—
Lakin, David F., 4,691,679, Cl. 123-450.000.

Lufkin, John R.: *See*—
Otteman, John H.; and Lufkin, John R., 4,691,669, Cl. 123-41.150.

Luft, Christa: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., to Exxon Research and Engineering Company. Method for controlling viscosity of organic liquids and compositions. 4,692,268, Cl. 252-33.400.

Lustig, Lee M.; and Ellis, Gary D., to Dresser Industries, Inc. Isolation valve with frangible flapper element. 4,691,775, Cl. 166-317.000.

Lutke-Foller, Heinz: *See*—
Haver, Eitel F.; Lutke-Foller, Heinz; and Wossmann, Reinhard, 4,691,744, Cl. 139-425.00R.

Lux, Karl-Heinz: *See*—
Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, 4,692,570, Cl. 200-4.000.

Lynn, Jesse L., Jr.: *See*—
Secemski, Isaac I.; and Lynn, Jesse L., Jr., 4,692,275, Cl. 252-534.000.

Lynx Golf, Inc.: *See*—
Boone, David D., 4,691,388, Cl. 2-161.00A.

Lyons, James E.: *See*—
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,692,426, Cl. 502-154.000.

M.A.N.Maschinenfabrik Augsburg-Nurnberg: *See*—
Katernberg, Helmut; and Kohler, Ingolf, 4,691,656, Cl. 114-45.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Dorn, Alfred, 4,692,739, Cl. 340-365.00P.

MacChesney, John B.: *See*—
Cohen, Leonard G.; Johnson, David W., Jr.; and MacChesney, John B., 4,691,990, Cl. 350-96.330.

MacDonald, Donald M.: *See*—
Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., 4,692,212, Cl. 162-206.000.

MacGovern, Alan J.; and Hutchin, Richard A., to Itek Corporation. Spatial processing for single or dual shear wavefront sensor. 4,692,027, Cl. 356-353.000.

Machihara, Akio: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.

Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Process for printed draw-formed body, and container formed by this process. 4,692,810, Cl. 358-256.000.

Machin, Roy. Washing apparatus for a motor vehicle. 4,691,401, Cl. 15-53.00A.

Macht, Alwin: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin. 4,691,670, Cl. 123-52.0MF.

MacWilliams, Dalton C.: *See*—
Beck, H. Nelson; and MacWilliams, Dalton C., 4,692,355, Cl. 427-297.000.

Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, to Delphax Systems. Toner transfer apparatus. 4,692,017, Cl. 355-3.0DD.

Maeda, Isamu, to Kankyo Souken Consultant, Co., Ltd. Metal melting furnace. 4,691,900, Cl. 266-156.000.

Maeda Metal Industries Ltd.: *See*—
Fujita, Masahiro; and Uemura, Yukio, 4,691,786, Cl. 173-12.000.

Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, to Nippon Steel Corporation. Method of improving functions of surface of alloy steel by means of irradiation of laser beam, and alloy steel and structure made by the method. 4,692,191, Cl. 148-6.14R.

Maeda, Yukio; Kudo, Shinichi; and Saeki, Keiji, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for drawing a thick film circuit. 4,692,351, Cl. 427-196.000.

Maehara, Toshifumi, to Akebono Brake Industry Co., Ltd. Antiskid control system. 4,691,969, Cl. 303-113.000.

Maekawa, Junichi, to Ohi Seisakusho Co., Ltd. Window regulator. 4,691,475, Cl. 49-352.000.

Maenishi, Kozo; and Nakanishi, Youichi, to Omron Tateisi Electronics Co. Self-aligning spring mechanism for an electrical switch. 4,692,728, Cl. 335-192.000.

Magdolen, Viktor: *See*—
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

Magnetic Massage Company: *See*—
Sato, Ray S., 4,691,693, Cl. 128-24.100.

Mahurkar, Sakharam D. Double lumen catheter. 4,692,141, Cl. 604-43.000.

Maibuk, Zinovy-Jury Y.: *See*—
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

Maige, Philippe: *See*—
de Sartre, Jean; and Maige, Philippe, 4,692,853, Cl. 363-49.000.

Majoch, Tim R.: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,691,703, Cl. 128-303.100.

Makihara, Hiroshi: *See*—
Asaeda, Masashi; Mori, Kazutaka; and Makihara, Hiroshi, 4,692,354, Cl. 427-244.000.

Makita, Masaru, to Canon Kabushiki Kaisha. Printing apparatus capable of correcting printed characters by offset prints. 4,692,045, Cl. 400-697.000.

Malancon, Irvin P., Jr. Container and holder for dispensing baking soda. 4,691,822, Cl. 206-229.000.

Malashkin, Michail: *See*—
Cargill, N. Allen; and Malashkin, Michail, 4,691,910, Cl. 271-3.000.

Malesci S.p.A. Istituto Farmacobiologico: *See*—
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,692,525, Cl. 544-360.000.

Maletz, Gerd: *See*—
Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., 4,692,425, Cl. 502-81.000.

Malhotra, Sudarshan K.; and Evoy, Ingrid L., to Dow Chemical Company, The. Diphenoxymethylpyridines and compositions containing same having herbicidal properties. 4,692,183, Cl. 71-94.000.

Malmeblad, Sven-Erik: *See*—
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,692,209, Cl. 162-30.100.

Manabe, Takashi: *See*—
Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, 4,692,444, Cl. 514-406.000.

Manda R & D: *See*—
Manska, Wayne E., 4,691,979, Cl. 439-82.000.

Manduley, Flavio, to Pitney Bowes Inc. General purpose processor module for mailroom equipment. 4,692,870, Cl. 364-466.000.

Mann, Yale; and Sarssi, Pekka. Vehicle protection device. 4,691,801, Cl. 180-287.000.

Mannesmann, Gerda: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Mannesmann Kienzle GmbH: *See*—
Dyma, Horst; and Heindke, Armin, 4,692,041, Cl. 400-82.000.

Manring, Lewis E.; and Mazur, Stephen, to Du Pont de Nemours, E. I., and Company. Metal interlayers in films by counter-current diffusion. 4,692,360, Cl. 427-443.100.

Manska, Wayne E., to Manda R & D. Compliant press-fit electrical contact. 4,691,979, Cl. 439-82.000.

Manville Corporation: *See*—
Sadler, Thomas H., 4,692,128, Cl. 474-8.000.
Smith, Henry D., Jr.; Arterburn, Russell D.; and Miller, John H., 4,692,178, Cl. 65-2.000.

Maquinas NPU Ltda.: *See*—
dos Santos Copia, Carlos R., 4,692,134, Cl. 493-196.000.

Marconi Company Limited, The: *See*—
Wilson, David J. M.; and Cope, Paul E. G., 4,692,614, Cl. 250-231.00R.

Marhic, Gerard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Plasma welding or cutting system provided with a delay. 4,692,582, Cl. 219-121.0PT.

Maric, Dane: *See*—
Tarrsoe, Emanuel B.; Maric, Dane; and Kelly, Thomas P., 4,691,404, Cl. 15-167.00R.

Marketing Displays, Inc.: *See*—
Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, 4,691,892, Cl. 248-624.000.

Markovitz, Mark: *See*—
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,692,499, Cl. 525-524.000.

Markure, Laura A.: *See*—
Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

Marmel, Max: *See*—
Jordan, Harold V.; and Marmel, Max, 4,692,407, Cl. 435-36.000.

Marmet, Melvin: *See*—
Ouyang, Kenneth W.; and Marmet, Melvin, 4,692,717, Cl. 331-111.000.

Marotta Scientific Controls, Inc.: *See*—
Kowalski, Slawomir, 4,691,736, Cl. 137-557.000.

Marra, Gerardo J. Powered roof shingle detacher and stripper apparatus. 4,691,439, Cl. 30-170.000.

Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, to Licentia Patent-Verwaltungs-GmbH; and ANT Nachrichtentechnik GmbH. Mushroom-shaped semiconductor stripe laser. 4,692,926, Cl. 372-46.000.

Marschner, Friedemann: *See*—
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.

Marsden, Peter; and Bradwell, Paul R., to Haden Drysys International Limited. Apparatus and method for applying material to articles. 4,692,358, Cl. 427-421.000.

Martin, Colin L.: *See*—
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., 4,692,350, Cl. 427-138.000.

Martin, Gregory C., to Pulse Electronics, Inc. Railroad coupler mount. 4,691,563, Cl. 73-129.000.

Martin, Jack. Apparatus for drying hair from the inside out. 4,692,594, Cl. 219-373.000.

Martin, Philip N. Projectile powered piston. 4,691,803, Cl. 181-113.000.

Martin, Stewart O.: *See*—
Extance, Philip; Jones, Roger E.; and Martin, Stewart O., 4,692,703, Cl. 324-251.000.

Martindell, J. Richard. Handle adapter and chuck apparatus for power bits. 4,692,073, Cl. 408-239.00A.

Martinez, Robert, to Vistakon, Inc. Package for hydrophilic contact lens. 4,691,820, Cl. 206-205.000.

Martirosian, Ruben G.: *See*—
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

Maruta, Riichiro: *See*—
Mayumi, Junji; and Maruta, Riichiro, 4,692,357, Cl. 427-393.500.

Maruyama, Hidekazu, to Ikeda Bussan Co., Ltd. Seat with garnished seat cushion. 4,691,966, Cl. 297-452.000.

Maruyama, Kimiaki: *See*—
Dunbar, Joseph E.; and Maruyama, Kimiaki, 4,692,467, Cl. 514-609.000.

Maruyama, Yuuji: *See*—
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Marzili, Joseph C.; and Stephenson, Brian D., to AMP Incorporated. Cover for flat cable connector. 4,691,977, Cl. 439-404.000.

Masaki, Takeshi: *See*—
Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, 4,691,998, Cl. 350-616.000.

Maschhoff, Robert H.: *See*—
Gard, Michael F.; Warmack, Ralph E.; Lee, Kyong H.; and Maschhoff, Robert H., 4,692,909, Cl. 367-45.000.

Mase, Akira: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Mason, Richard W.: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Massaloux, Dominique: *See*—
Anizan, Paul; Collobert, Daniel; and Massaloux, Dominique, 4,692,892, Cl. 364-807.000.

Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, to Konishiroku Photo Industry Co., Ltd. Method for synthesizing a magenta coupler by selectively etherifying 4-hydroxy-5-pyrazolone. 4,692,529, Cl. 546-141.000.

Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, to Murata Manufacturing Co., Ltd. Pyroelectric type detecting device. 4,692,619, Cl. 250-338.000.

Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, to Jeco Co., Ltd. Angle sensor. 4,692,613, Cl. 250-231.0SE.

Masuda, Tatsuo: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.

Masuda, Yoshifumi: *See*—
Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, 4,692,025, Cl. 356-45.000.

Masuzaki, Hidefumi; and Horikawa, Etsuo, to Hitachi, Ltd. Image data processing system. 4,692,944, Cl. 382-41.000.

Materials Development Corporation: *See*—
Johnson, Philip C., 4,692,385, Cl. 428-469.000.

Mather, Douglas E.: *See*—
Messenger, Edward T.; Mather, Douglas E.; and Phillips, Brinley M., 4,692,271, Cl. 252-354.000.

Mathis, Terry D.: *See*—
Aberson, James A., Jr.; DeVeau, George F., Jr.; Mathis, Terry D.; and Miller, Calvin M., 4,691,986, Cl. 350-96.210.

Mathison, Allen D., to Cherne Industries, Inc. Electronic test and seal apparatus and method. 4,691,728, Cl. 137-15.000.

Matier, William L.: *See*—
Erhardt, Paul W.; and Matier, William L., 4,692,446, Cl. 514-234.000.

Matsuda, Fumio: *See*—
Takekawa, Yujiro; and Matsuda, Fumio, 4,691,745, Cl. 139-435.000.

Matsuda, Hidemi: *See*—
Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, 4,692,659, Cl. 313-402.000.

Matsuda, Takeshi; Miyamoto, Masasi; and Takei, Toshihiro, to Nippondenso Co., Ltd. Fuel pump apparatus for internal combustion engine. 4,692,092, Cl. 415-143.000.

Matsuda, Yuzuru: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Matsui, Minoru; and Soma, Takao, to NGK Insulators, Ltd. Silicon nitride sintered body and manufacturing method thereof. 4,692,419, Cl. 501-97.000.

Matsui, Sadayoshi: *See*—
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,692,206, Cl. 156-649.000.

Matsumoto, Fumio, to Fuji Photo Film Co., Ltd. Photographic printing system. 4,692,797, Cl. 358-76.000.

Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, to Sumitomo Metal Mining Company Limited. Dielectric ceramics. 4,692,421, Cl. 501-136.000.

Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, to Fujitsu Limited. Multilayer printed wiring board. 4,692,843, Cl. 361-414.000.

Matsumoto, Ryouhei: *See*—
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,691,499, Cl. 53-451.000.

Matsushita Electric Industrial Co.: *See*—
Fukunaga, Masao; and Nonoguchi, Hiroshi, 4,691,870, Cl. 241-36.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Dohi, Takashi; Shibata, Nobuho; and Ohara, Kenichi, 4,692,676, Cl. 318-269.000.
Gotou, Makoto, 4,692,645, Cl. 310-184.000.
Gotou, Makoto, 4,692,646, Cl. 310-184.000.
Maeda, Yukio; Kudo, Shinichi; and Saeki, Keiji, 4,692,351, Cl. 427-196.000.
Moriya, Mitsuro; Shiragami, Kazuharu; and Yamaguchi, Hiroyuki, 4,692,915, Cl. 369-53.000.
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,691,653, Cl. 112-275.000.
Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, 4,691,998, Cl. 350-616.000.
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Matsushita Electric Works, Ltd.: *See*—
Murakami, Kazumasa; and Terada, Motoharu, 4,692,750, Cl. 340-588.000.

Matsushita Refrigeration Company: *See*—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Matsuzaka, Syoji: *See*—
Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, 4,692,400, Cl. 430-553.000.

Matsuzaki, Mikio, to Akebono Brake Industry Company Ltd. Disc brake with pad pressed only at ends where antinodes of vibration occur. 4,691,810, Cl. 188-73.100.

Mattarelli, Ennio, to Dynamit Nobel Aktiengesellschaft. Break-open action for sporting rifles. 4,691,462, Cl. 42-75.040.

Mattei, Luciano: *See*—
Santambrogio, Alberto; and Mattei, Luciano, 4,692,170, Cl. 44-63.000.

Matzat, Norbert; and Schreiber, Hans, to Optimol-Oelwerke GmbH. Lubricating grease composition, its production and use. 4,692,255, Cl. 252-51.50A.

Matzuk, Terrance, to Dymax Corporation. Tissue signature tracking transceiver having upconverted IF amplification. 4,691,571, Cl. 73-632.000.

Mauer, John L., IV: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.

Maximovitch, Suzanne: *See*—
Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, 4,692,226, Cl. 204-73.00R.

Maxon Industries, Inc.: *See*—
Verner Michael L., 4,691,959, Cl. 296-184.000.

May, Gordon H. Electronic percussion instrument. 4,691,611, Cl. 84-421.000.

May, Michael D., to Inmos Limited. Microcomputer with interprocess communication. 4,692,861, Cl. 364-200.000.

Maya, Jakob: *See*—
Moskowitz, Philip E.; and Maya, Jakob, 4,692,661, Cl. 313-485.000.

Maycock, Ian C.; and Hodgson, Derek, to Automotive Products Plc. Friction clutch and clutch release mechanism for a vehicle. 4,691,815, Cl. 192-98.000.

Mayer & Cie. GmbH & Co.: *See*—
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, 4,691,535, Cl. 66-144.000.

Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, to Wacker-Chemie GmbH. Method for preparing plastic foams. 4,692,474, Cl. 521-88.000.

Mayer, Siegfried; and Greisner, Paul, to Aug. Winkhaus GmbH & Co. KG. Device for detachably securing pivotally connected members in a predetermined relative position. 4,691,950, Cl. 292-269.000.

Mayerhofer, Walter: *See*—
Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

Mayo Medical Resources: *See*—
Gray, Joel E., 4,692,704, Cl. 324-318.000.

Mayumi, Junji; and Maruta, Riichiro, to Mitsubishi Petrochemical Co., Ltd. Primer composition for olefin resin. 4,692,357, Cl. 427-393.500.

Mazda Motor Corp.: *See*—
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.
Iwaki, Masato, 4,691,675, Cl. 123-339.000.

Mazur, Stephen: *See*—
Manring, Lewis E.; and Mazur, Stephen, 4,692,360, Cl. 427-443.100.

Mazzagatti, Roy P.; and Dowling, Donald J., to Texaco Inc. Well logging means and method for determining water saturation of a petroleum reservoir having two transmitters and two receivers. 4,692,706, Cl. 324-338.000.

McAlister, Roy E. Organosilicon compounds. 4,692,537, Cl. 556-484.000.

McBride, Donald G.; and Rickert, Robert G., to International Business Machines Corporation. Method and apparatus for controlling the surface chemistry on objects plated in an electroless plating bath. 4,692,346, Cl. 427-8.000.

McCreary Industrial Products Co.: *See*—
Johnson, James L., 4,692,362, Cl. 428-35.000.

McCune, William L., to Aspen Laboratories, Inc. Control valve for use with tourniquet system. 4,691,738, Cl. 137-627.500.

McDonald, Michael C.: *See*—
Reichman, James M.; McDonald, Michael C.; and O'Brien, T. B., 4,691,790, Cl. 175-67.000.

McDow, William R.: *See*—
Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., 4,691,587, Cl. 74-493.000.

McKenna, Daniel: *See*—
LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, 4,692,607, Cl. 250-205.000.

McKeown, Thomas J., to Cellucap Manufacturing Company. Sanitary headdress. 4,691,390, Cl. 2-200.000.

McLeod, Roderick D. Well casing packer. 4,691,770, Cl. 166-73.000.

McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., to Halliburton Company. Hydrostatic referenced safety-circulating valve. 4,691,779, Cl. 166-321.000.

McMichael, John. Immunotherapeutic methods and compositions employing antigens characteristic of malignant neoplasms. 4,692,332, Cl. 424-88.000.

McNeely, David L., to RCA Corporation. Circuitry for calculating magnitude of vector sum from its orthogonal components in digital television receiver. 4,692,889, Cl. 364-730.000.

McNeilab, Inc.: *See*—
Carson, John R., 4,692,460, Cl. 514-443.000.
Troutner, Vernon H.; and King, Martin J., 4,692,138, Cl. 604-4.000.

McQuade, Donald E., Sr. Gate locking device. 4,691,541, Cl. 70-77.000.

Mead Corporation, The: *See*—
Johnson, Roy A.; and Ganz, Robert H., 4,691,606, Cl. 83-175.000.
Schuh, Rudolf, 4,691,495, Cl. 53-48.000.

Mears, Christopher J.: *See*—
Riley, Clifford; and Mears, Christopher J., 4,692,308, Cl. 422-65.000.

Measurex Corporation: *See*—
Hegland, Philip; and Chase, Lee, 4,692,616, Cl. 250-252.100.

Mechanical Technology Incorporated: *See*—
Hoogenboom, Leo, 4,692,611, Cl. 250-227.000.

Meckler, Milton. Cogeneration and central regeneration multi-contactor air conditioning system. 4,691,530, Cl. 62-238.100.

Medasonics Inc.: *See*—
Ingle, Frank W.; and Claude, John P., 4,691,418, Cl. 29-25.350.

Medinger, Bernhard: *See*—
Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, 4,692,189, Cl. 106-308.00S.

Medtronic, Inc.: *See*—
Duggan, Stephen R., 4,692,147, Cl. 604-93.000.

Medwid, Jeffrey B.; and Torley, Lawrence W., to American Cyanamid Company. Substituted quinolinediones. 4,692,449, Cl. 514-254.000.

Meger, Peter: *See*—
Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, 4,692,930, Cl. 373-72.000.

Mehra, Yuv R., to Advanced Extraction Technologies, Inc. Process for using alkyl substituted C8-C10 aromatic hydrocarbons as preferential physical solvents for selective processing of hydrocarbon gas streams. 4,692,179, Cl. 62-17.000.

Meier, Willi, to Dorina Nahmaschinen GmbH. Lateral movement feed dog for a sewing machine. 4,691,654, Cl. 112-303.000.

Meinan Machinery Works, Inc.: *See*—
Koba, Yoshinori, 4,691,629, Cl. 100-121.000.

Meints, Gayle L.: *See*—
Person, Herman R.; Raesner, Dennis L.; and Meints, Gayle L., 4,692,655, Cl. 313-15.000.

Meisner, Douglas: *See*—
Rice, Mark; and Meisner, Douglas, 4,692,006, Cl. 354-75.000.

Meistrell, Robert W., to Dive N'Surf. Headband attachable to spectacles frame stems. 4,692,002, Cl. 351-156.000.

Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, to AB Volvo. Load-sensing faceform for crash dummy instrumentation. 4,691,556, Cl. 73-12.000.

Mengel, William F., to F. F. Mengel Company. Apparatus and method for removing pavement. 4,692,058, Cl. 404-72.000.

Menke, Andrew: *See*—
Niekrasz, Frank; and Menke, Andrew, 4,691,486, Cl. 52-172.000.

Menley & James Laboratories, Ltd.: *See*—
Banerjee, Pradip K., 4,692,462, Cl. 514-449.000.

Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., to Corning Glass Works. Apparatus and method for monitoring tension in a moving fiber by Fourier transform analysis. 4,692,615, Cl. 250-231.00R.

Merchant, David E., to Emhart Industries, Inc. Fire panel with door providing ease of service. 4,692,838, Cl. 361-380.000.

Merchant, Philip, Jr.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.

Merck & Co., Inc.: *See*—
Alexander, Jose; Repta, A. J.; and Fix, Joseph A., 4,692,441, Cl. 514-194.000.
Parsons, William H.; and Patchett, Arthur A., 4,692,522, Cl. 540-523.000.

Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, to General Electric Company. Memory efficient cell texturing for advanced video object generator. 4,692,880, Cl. 364-521.000.

Messenger, Edward T.; Mather, Douglas E.; and Phillips, Brinley M., to Albright & Wilson Ltd. Concentrated aqueous surfactant compositions. 4,692,271, Cl. 252-354.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Kranz, Walter, 4,691,876, Cl. 244-3.220.
Kulinyak, Ernst, 4,692,094, Cl. 416-11.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.
Sander, Wilfried; Essig, Gunder; and Wacker, Erich, 4,691,622, Cl. 92-233.000.

Methane Drainage Ventures: *See*—
Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., 4,691,789, Cl. 175-62.000.

Metz, Joseph R., to Norco,Inc. Panel fastener. 4,692,075, Cl. 411-7.000.

Meyer, David A.; Tasson, Brian B.; Vollmer, Robert F.; and Warren, J. Bruce, to Honeywell Inc. Cased telescoped ammunition. 4,691,638, Cl. 102-434.000.

Meyer, Eugene F., to Town Talk, Inc. Cap having stiffeners. 4,691,389, Cl. 2-195.000.

Meyer, Norbert: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.
Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, 4,692,187, Cl. 71-107.000.

Miceli, William J.: *See*—
Bocker, Richard P.; and Miceli, William J., 4,692,885, Cl. 364-606.000.

Mich, Thomas F.; and Heifetz, Carl L., to Warner-Lambert Company. Opthalmic use of quinolone antibiotics. 4,692,454, Cl. 514-312.000.

Michaely, William J., to Stauffer Chemical Company. N-(ortho-substituted) benzyl, 3-trifluoromethylphenoxy nicotinamides as herbicides. 4,692,185, Cl. 71-94.000.

Michaux, Daniel: *See—*
Garcia, Raoul; Michaux, Daniel; and Sales, Andre , 4,691,724, Cl. 134-169.00R.
Michigan State University: *See—*
Roppel, Thaddeus A.; Asmussen, Jes; and Reinhard, Donnie K., 4,691,662, Cl. 118-50.100.
Mick, Felix W.: *See—*
Sauerwein, Kurt; Kinzer, Norbert; and Mick, Felix W., 4,692,628, Cl. 250-497.100.
Mickal, Hermann: *See—*
Gaul, Hartmut; Mickal, Hermann; and Haboeck, Adolf, 4,692,632, Cl. 307-66.000.
Midmark Corporation: *See—*
Kuck, Jay L., 4,691,393, Cl. 5-62.000.
Midrex International, B.V.: *See—*
Whitten, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., 4,691,868, Cl. 241-24.000.
Mierswa, Christian; and Schmutz, Friedrich, to Ernst Schmutz GmbH. Apparatus for cleaning radioactive tube banks. 4,691,723, Cl. 134-167.00C.
Mihara, Yuji, to Kabushiki Kaisha Toshiba. Electronic watt-hour meter. 4,692,874, Cl. 364-483.000.
Miki, Yasuhiko; and Takita, Kentaro, to Sony/Tektronix Corporation. Digital pattern generator. 4,692,886, Cl. 364-718.000.
Mikuniya, Kunio; and Kojima, Akira, to Tachikawa Spring Co. Ltd. Tandem seat for a two-wheeled vehicle. 4,691,963, Cl. 297-195.000.
Mildenberger, Hilmar: *See—*
Zeiss, Hans-Joachim; and Mildenberger, Hilmar, 4,692,541, Cl. 558-87.000.
Miller, Calvin M.: *See—*
Aberson, James A., Jr.; DeVeau, George F., Jr.; Mathis, Terry D.; and Miller, Calvin M., 4,691,986, Cl. 350-96.210.
Miller, Clifford C.: *See—*
Silvernail, James M.; and Miller, Clifford C., 4,691,722, Cl. 134-155.000.
Miller, Gary E. Simultaneous C and N bio-oxidation with multi-stage RBC recycling. 4,692,250, Cl. 210-619.000.
Miller, John G.: *See—*
Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., 4,691,987, Cl. 350-96.230.
Miller, John H.: *See—*
Smith, Henry D., Jr.; Arterburn, Russell D.; and Miller, John H., 4,692,178, Cl. 65-2.000.
Miller, Laurence L., to TRW Inc. Fluid flow control apparatus for a power steering system. 4,691,797, Cl. 180-143.000.
Miller, Louis D.; and Kaiser, Donald B., to RCA Corporation. Imaging system having an improved support bead and connector. 4,692,658, Cl. 313-365.000.
Miller, Mahlon A., to Newmar Corporation. Door stop and latch. 4,691,958, Cl. 296-146.000.
Miller, Raymond S.: *See—*
Costa, Lorenzo F.; Harrington, David C.; and Miller, Raymond S., 4,692,266, Cl. 252-301.170.
Mills, William R., Jr.: *See—*
Allen, Linus S.; Mills, William R., Jr.; and Stromswold, David C., 4,692,617, Cl. 250-270.000.
Milton, Thomas J.: *See—*
Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., 4,691,587. Cl. 74-493.000.
Minamikawa, Susumu: *See—*
Fukui, Ryoichi; and Minamikawa, Susumu, 4,692,034, Cl. 374-208.000.
Minckler, L. Sherwood: *See—*
Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., 4,692,268, Cl. 252-33.400.
Mine Kinzoku Kogyo K.K.: *See—*
Ikeda, Sakio; and Yonamine, Shozen, 4,691,717, Cl. 131-365.000.
Mine Safety Appliances Company: *See—*
Auel, RaeAnn M.; Jolson, Joseph D.; and Stewart, David A., 4,692,220, Cl. 204-1.00T.
Mineshima, Hideo; Koda, Haruyuki; and Yamamoto, Ryoichi, to Mitsui Petrochemical Industries, Ltd. Process for continuous multi-stage polymerization of olefins. 4,692,501, Cl. 526-65.000.
Minet, Ronald G.; and Warren, David, to Kinetics Technology International Corporation. Catalytic reaction apparatus. 4,692,306, Cl. 422-49.000.
Ministry of Industry & Minerals Specialized Institute for Engineering Industries: *See—*
Ahmed, Jaleel K., 4,692,353, Cl. 427-216.000.
Ministry of International Trade & Industry: *See—*
Owada, Toshiro; Kosugi, Kenichi; and Nagase, Yasuo, 4,691,909, Cl. 270-58.000.
Minnesota Mining and Manufacturing Company: *See—*
Montalbano, Peter, 4,692,122, Cl. 439-882.000.
Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., 4,691,993, Cl. 350-105.000.
Schwartz, Thomas W., 4,691,845, Cl. 222-94.000.
Minolta Camera Kabushiki Kaisha: *See—*
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.
Miranda, Sandra: *See—*
Binker, Norman; and Miranda, Sandra, 4,692,162, Cl. 604-385.00R.
Mita Industrial Co., Ltd.: *See—*
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Hirao, Tadashi, 4,691,436, Cl. 437-33.000.
Iwata, Shigemi, 4,691,807, Cl. 187-117.000.
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.
Kumatani, Hiroshi; and Yamaura, Yutaka, 4,691,588, Cl. 74-512.000.
Nakatsuka, Masanori, 4,692,788, Cl. 357-72.000.
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Asaeda, Masashi; Mori, Kazutaka; and Makihara, Hiroshi, 4,692,354, Cl. 427-244.000.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Mayumi, Junji; and Maruta, Riichiro, 4,692,357, Cl. 427-393.500.
Mitsui Petrochemical Industries, Ltd.: *See—*
Mineshima, Hideo; Koda, Haruyuki; and Yamamoto, Ryoichi, 4,692,501, Cl. 526-65.000.
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.
Mitutoyo Mfg., Co., Ltd.: *See—*
Nakamura, Taizo, 4,692,629, Cl. 250-560.000.
Miyadera, Kazuhiko, to Toyota Jidosha Kabushiki Kaisha. Console box for automobile. 4,691,960, Cl. 296-37.800.
Miyai, Masahiko: *See—*
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.
Miyake, Toshihide: *See—*
Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, 4,692,025, Cl. 356-45.000.
Miyamoto, Masasi: *See—*
Matsuda, Takeshi; Miyamoto, Masasi; and Takei, Toshihiro, 4,692,092, Cl. 415-143.000.
Miyamoto, Toshiyuki: *See—*
Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.
Miyasako, Yoji, to Kabushiki Kaisha Toshiba. Current mirror circuit. 4,692,711, Cl. 330-257.000.
Miyata, Tsutomu; and Nagai, Masahide, to Kabushiki Kaisha Daini Seikosha. Device for discriminating attitude of parts. 4,692,881, Cl. 364-551.000.
Miyatake, Hideshi: *See—*
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.
Miyawaki, Mamoru: *See—*
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.
Mizuno, Masahiro: *See—*
Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, 4,692,414, Cl. 435-291.000.
Mizusawa, Akira, to Nifco Inc. Ventilator device for vehicle. 4,691,623, Cl. 98-2.180.
Mizutani, Isao: *See—*
Enomoto, Akio, 4,692,581, Cl. 219-10.810.
Mobil Oil Corporation: *See—*
Allen, Linus S.; Mills, William R., Jr.; and Stromswold, David C., 4,692,617, Cl. 250-270.000.
Bahl, Surinder K.; Canterino, Peter J.; and Shaw, Richard G., 4,692,496, Cl. 525-240.000.
Caesar, Philip D., 4,692,423, Cl. 502-62.000.
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., 4,692,350, Cl. 427-138.000.
Gunesin, Binnur Z., 4,692,492, Cl. 524-731.000.
Horodysky, Andrew G., 4,692,257, Cl. 252-49.600.
Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, 4,692,379, Cl. 428-349.000.
Neeley, Walter P., 4,692,906, Cl. 367-15.000.
Mochizuki, Kanji: *See—*
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.
Mochizuki, Nobumasa, to Mochizuki Precision Machine Industries Co., Ltd. Cutting apparatus. 4,691,871, Cl. 241-166.000.
Mochizuki Precision Machine Industries Co., Ltd.: *See—*
Mochizuki, Nobumasa, 4,691,871, Cl. 241-166.000.
Mock, Elmar; and Gabus, Georges A., to ETA SA Fabriques d'Ebauches. Timepiece having case formed of rock-like material. 4,692,033, Cl. 368-280.000.
Molecular Diagnostics, Inc.: *See—*
Dattagupta, Nanibhushan, 4,692,509, Cl. 530-303.000.
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, to Metallgesellschaft Aktiengesellschaft. Process for producing a product gas containing carbon oxides and hydrogen from methanol. 4,692,322, Cl. 423-415.00A.

Molnlycke AB: *See—*
Widlund, Leif U. R.; and Ternstrom, Maj I., 4,692,163, Cl. 604-385.00A.

Momoki, Motoyasu: *See—*
Takahara, Masayuki; and Momoki, Motoyasu, 4,692,824, Cl. 360-85.000.

Momose, Yutaka: *See—*
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,691,591, Cl. 74-606.00A.

Monma, Hideo; Ishiguro, Masato; and Kawano, Tetsuo, to Fujitsu Limited. Gate array. 4,692,783, Cl. 357-42.000.

Monsanto Company: *See—*
Lee, Len F., 4,692,184, Cl. 71-94.000.

Monsigny, Jean, to Aciers et Outillage Peugeot. Guiding rail of use in particular in a passive safety belt device for a motor vehicle. 4,691,938, Cl. 280-804.000.

Montague, Robert A.: *See—*
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; and Tetenbaum, Marvin T., 4,692,383, Cl. 428-414.000.

Montalbano, Peter, to Minnesota Mining and Manufacturing Company. Electrical terminal. 4,692,122, Cl. 439-882.000.

Montanwerke Walter GmbH: *See—*
Helle, Hans-Joachim, 4,691,479, Cl. 51-165.710.

Moog Inc.: *See—*
Hall, Larry D., 4,691,621, Cl. 92-184.000.

Moore, David G.: *See—*
Ford, John M. B.; and Moore, David G., 4,691,847, Cl. 222-259.000.

Moore, Denny L. Chimney flue cover. 4,691,624, Cl. 98-59.000.

Moore, Derek V.: *See—*
Lane, Kerry S.; and Moore, Derek V., 4,692,682, Cl. 320-35.000.

Moosz, Alexander P. Electronic apparatus for generating sets of numerical values for playing lottery games. 4,692,863, Cl. 364-412.000.

Morbitzer, Hans P.: *See—*
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

Morgan Industries, Inc.: *See—*
Theis, Peter F., 4,692,817, Cl. 360-12.000.

Morgan, John A. Powered reclining chair. 4,691,964, Cl. 297-330.000.

Morgand, Jean P., to Thomson CSF. Electroacoustic transducer with piezoelectric diaphragm. 4,692,942, Cl. 381-114.000.

Mori, Katsuhiro: *See—*
Kito, Masahiro; and Mori, Katsuhiro, 4,691,761, Cl. 165-32.000.

Mori, Kazutaka: *See—*
Asaeda, Masashi; Mori, Kazutaka; and Makihara, Hiroshi, 4,692,354, Cl. 427-244.000.

Mori, Yutaka: *See—*
Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, 4,691,796, Cl. 180-142.000.

Morikawa, Michio; and Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for continuously producing at a flow rate a strip of dough of constant dimensions. 4,692,107, Cl. 425-140.000.

Morikawa, Tuneo: *See—*
Kabe, Kazuyuki; and Morikawa, Tuneo, 4,691,752, Cl. 152-527.000.

Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, to Mita Industrial Co., Ltd. Document size detecting device. 4,692,019, Cl. 355-8.000.

Morimoto, Seiji: *See—*
Yorisue, Shozo; and Morimoto, Seiji, 4,691,536, Cl. 66-168.000.

Morimoto, Yoshio: *See—*
Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, 4,691,874, Cl. 242-80.000.

Morimura, Toshio: *See—*
Watanabe, Yoji; Morimura, Toshio; and Toyoda, Yukio, 4,692,313, Cl. 422-241.000.

Morisawa, Kunio: *See—*
Taga, Yutaka; and Morisawa, Kunio, 4,691,594, Cl. 74-869.000.

Morita, Shigeru; and Yanagawa, Nobuhide, to Kubota, Ltd. Load handling vehicle. 4,692,086, Cl. 414-635.000.

Morita, Yoshiyuki, to Seiko Instruments & Electronics Ltd. Digitizer using phase inversion detection system. 4,692,568, Cl. 178-19.000.

Moriya, Mitsuro; Shiragami, Kazuharu; and Yamaguchi, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Recording and reproduction apparatus having improved reliability with respect to externally applied vibration or impact. 4,692,915, Cl. 369-53.000.

Morman, Michael T.; and Wisneski, Tony J., to Kimberly-Clark Corporation. High temperature method of making elastomeric materials and materials obtained thereby. 4,692,371, Cl. 428-224.000.

Morris, Kevin: *See—*
Graham, Thomas; Perrins, Leslie A.; and Morris, Kevin, 4,691,838, Cl. 220-93.000.

Morton, Henry H., Jr.: *See—*
Pinsak, George F.; and Morton, Henry H., Jr., 4,692,748, Cl. 340-573.000.

Moser, Alfred: *See—*
Polanschutz, Wolfgang; Pochmarski, Luzian; and Moser, Alfred, 4,691,757, Cl. 164-416.000.

Moskovskoe Vysshee Tekhnicheskoe Uchilische, Imeni N.E. Baumana: *See—*
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.

Moskowitz, David: *See—*
Pinkerton, Michael B.; and Moskowitz, David, 4,691,974, Cl. 439-147.000.

Moskowitz, Philip E.; and Maya, Jakob, to GTE Products Corporation. Fluorescent lamp with static magnetic field generating means. 4,692,661, Cl. 313-485.000.

Moss, Joe B.: *See—*
Campbell, Eric R.; and Moss, Joe B., 4,692,564, Cl. 174-92.000.

Motamedi, M. Ed: *See—*
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Motorola, Inc.: *See—*
Dahl, Randy L., 4,692,631, Cl. 290-55.000.
Green, Steven R.; De Muro, David M.; and Sokola, Raymond L., 4,692,726, Cl. 333-206.000.
Gregg, Ralph C., Jr., 4,692,763, Cl. 342-28.000.
Rendek, Peter M., 4,691,568, Cl. 73-517.00R.
Titus, John D.; and Hall, Phillip E., 4,691,634, Cl. 102-245.000.
Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., 4,692,571, Cl. 200-5.00A.
Zdunek, Kenneth J., 4,692,945, Cl. 455-17.000.

Mould, Richard E. Video subconscious display attachment. 4,692,118, Cl. 434-236.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See—*
Rossmann, Axel; and Huther, Werner, 4,692,288, Cl. 264-56.000.

Muchel, Franz, to Carl-Zeiss-Stiftung. Microscope tube. 4,691,997, Cl. 350-503.000.

Mudge, Paul R., to National Starch and Chemical Corporation. Flocking adhesives based on eva-maleate copolymers. 4,692,366, Cl. 428-90.000.

Mueller, Allan H.; Perkins, Dean P.; and Evans, Rhys M., to Geosource, Inc. Automatic force control for a seismic vibrator. 4,692,912, Cl. 367-190.000.

Mueller, Martin L. Tamper-evident sealed container and tamper-evident tube and bands and apparatus and method of making and using same. 4,691,835, Cl. 215-246.000.

Mueller, Richard A.; and Partis, Richard A., to G. D. Searle & Co. Protease inhibitors. 4,692,552, Cl. 562-475.000.

Mueller, Robert, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Limited slip differential system for a motor vehicle with all-wheel drive. 4,691,593, Cl. 74-714.000.

Muhlhofer, Rudolf: *See—*
Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

Mukai, Yasuteru: *See—*
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.

Mukohjima, Hitoshi: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Mullen, George B.: *See—*
Georgiev, Vassil S.; and Mullen, George B., 4,692,515, Cl. 540-203.000.

Muller, Erwin, to Siemens Aktiengesellschaft. Electromagnetic relay having an insulating cap and a method for manufacturing the insulating cap. 4,692,730, Cl. 335-278.000.

Muller, Friedemann: *See—*
Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.

Muller, Georges: *See—*
Lance, Jacques; and Muller, Georges, 4,691,425, Cl. 29-402.080.

Muller, Walheide: *See—*
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Muller, Walter, to Ewikon Entwicklung und Konstruktion GmbH & Co. Electrically operated heating element for a hot-runner tool. 4,692,595, Cl. 219-421.000.

Muller, Wolf-Dieter: *See—*
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.

Mullet, David L.; and Bontrager, Ivan W., to Excel Industries, Inc. Lawn edger attachment for tractors. 4,691,784, Cl. 172-15.000.

Multifastener Corporation: *See—*
Goodsmith, Dale H., 4,691,429, Cl. 29-432.000.

Multitech Industrial Corporation: *See—*
Hsu, Chi-Ching, 4,692,865, Cl. 364-419.000.

Murai, Masasumi, to Tsubakimoto Chain Co. Automotive body, floor conveyor, having pivotal carriers. 4,691,640, Cl. 104-140.000.

Murai, Yoshikazu: *See—*
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.

Murakami, Kazumasa; and Terada, Motoharu, to Matsushita Electric Works, Ltd. Fire alarm system. 4,692,750, Cl. 340-588.000.

Murase, Mikio, to Osaka Trunk Material Co., Ltd. Lock for slide fastener. 4,691,540, Cl. 70-68.000.

Murata, Fumiya: *See—*
Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.

Murata Kikai Kabushiki Kaisha: *See—*
Sakai, Shoji; and Noda, Koshi, 4,691,415, Cl. 19-262.000.

Murata Manufacturing Co., Ltd.: *See—*
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.
Wakino, Kikuo; Tamura, Hiroshi; and Ishikawa, Youhei, 4,692,727, Cl. 333-219.000.

Murata, Michihiro: *See—*
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.

Murayama, Kimimasa: *See—*
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Murphy, Dale P.; and Murphy, Paul D. Electronic hockey game. 4,691,920, Cl. 273-85.00A.

Murphy, Paul D.: *See—*
Murphy, Dale P.; and Murphy, Paul D., 4,691,920, Cl. 273-85.00A.

Murphy, William P. Die transfer system. 4,691,554, Cl. 72-448.000.

Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., to Exxon Research and Engineering Company. Preparation and use of catalysts comprising mixtures of tungsten oxide and silica on alumina. 4,692,428, Cl. 502-254.000.

Mutchler, Paul A., to Engineered Air Systems, Inc. Portable air heating apparatus. 4,691,687, Cl. 126-104.00A.

Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, to Nissan Motor Co., Ltd.; and Nihon Radiator Co., Ltd. Heater unit for vehicles. 4,691,862, Cl. 237-12.30A.

Myers, Harry K., Jr.: *See—*
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,692,426, Cl. 502-154.000.

Nabetani, Shinji: *See—*
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.

Nabisco Brands, Inc.: *See—*
Blain, William A.; and Zabrodsky, John, III, 4,691,625, Cl. 99-348.000.
Blain, William A.; and Zabrodsky, John, III, 4,691,625, Cl. 99-348.000.
Gannis, Peter M.; Wilkins, Howard; and Holloway, Oris E., Jr., 4,692,342, Cl. 426-293.000.

Nadler, Lee: *See—*
Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, 4,692,405, Cl. 435-7.000.

Nagai, Masaaki, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the ignition timing of an internal combustion engine. 4,691,678, Cl. 123-425.000.

Nagai, Masahide: *See—*
Miyata, Tsutomu; and Nagai, Masahide, 4,692,881, Cl. 364-551.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,692,131, Cl. 474-80.000.

Nagase, Yasuo: *See—*
Owada, Toshiro; Kosugi, Kenichi; and Nagase, Yasuo, 4,691,909, Cl. 270-58.000.

Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, to Canon Kabushiki Kaisha. Multi-color recording apparatus. 4,692,774, Cl. 346-76.0PH.

Nagata, Masanori: *See—*
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.

Nagayama, Kousei: *See—*
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Nagy, Ferenc: *See—*
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, to Epitestudomanyi Intezet & Konnyuipari Szerelo es Epito Vallalat. Apparatus and process for the construction of monolithic ceilings. 4,691,485, Cl. 52-125.100.

Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, to Lederle (Japan), Ltd.; and Takeda Chemical Industries, Ltd. Crystals of sodium cephemcarboxylate. 4,692,519, Cl. 540-227.000.

Naka, Hiroshi: *See—*
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.

Naka, Shigekatsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Multistage hydraulic machine. 4,692,090, Cl. 415-112.000.

Nakagawa, Hitoshi; and Kitahara, Kohei, to Seiko Epson Kabushiki Kaisha. Paper feeding apparatus for printers. 4,691,911, Cl. 271-9.000.

Nakagiri, Takashi: *See—*
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.

Nakahara, Yutaka: *See—*
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, to Sanden Corporation. Coffee roaster. 4,691,447, Cl. 34-4.000.

Nakajima, Junichi, to Fuji Kogyo Kabushiki Kaisha. Barking machine. 4,691,750, Cl. 144-208.00B.

Nakakawazi, Mikio: *See—*
Unno, Shohei; Nakakawazi, Mikio; and Suzuki, Kazufumi, 4,692,760, Cl. 340-756.000.

Nakamura, Taizo, to Mitutoyo Mfg., Co., Ltd. Optical type measuring scanner. 4,692,629, Cl. 250-560.000.

Nakamura, Tetsuro: *See—*
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.

Nakamura, Yasuhide: *See—*
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Semiconductor apparatus. 4,692,789, Cl. 357-74.000.

Nakanishi, Youichi: *See—*
Maenishi, Kozo; and Nakanishi, Youichi, 4,692,728, Cl. 335-192.000.

Nakano, Harumi, to Casio Computer Co., Ltd. Identification card including switching means for built-in battery. 4,692,601, Cl. 235-380.000.

Nakano, Takayuki: *See—*
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.

Nakano Vinegar Co., Ltd.: *See—*
Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, 4,692,414, Cl. 435-291.000.

Nakao, Masaaki: *See—*
Iwako, Motonari; and Nakao, Masaaki, 4,691,867, Cl. 241-21.000.

Nakao, Motokazu, to Sharp Kabushiki Kaisha. Color image readout device with detachable light source unit. 4,692,795, Cl. 358-75.000.

Nakaosa, Yoshitake: *See—*
Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.

Nakatake, Yoshiteru: *See—*
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.

Nakatsuka, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with solder overflow prevention geometry. 4,692,788, Cl. 357-72.000.

Nakayama, Hiromichi; and Fukuda, Moritoshi, to Nifco Inc. Hook device for ornamental button on seat cover. 4,691,416, Cl. 24-90.00B.

Nakayama, Yoshiharu: *See—*
Fuchigami, Wataru; and Nakayama, Yoshiharu, 4,692,129, Cl. 474-148.000.

Nakazato, Katsuo: *See—*
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Nakazumi, Tadataka: *See—*
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.

NAP Consumer Electronics Corp.: *See—*
Erski, Richard, 4,692,802, Cl. 358-139.000.

Nardella, Massimiliano, to F.B.M. Hudon Italiana S.p.A. Vacuum blade for a hollow type fan and process. 4,692,100, Cl. 416-232.000.

Narita, Akira: *See—*
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.

Nash, George S.: *See—*
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

Nasuda, Sigeyuki: *See—*
Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, 4,691,874, Cl. 242-80.000.

National Research Development Corporation: *See—*
de Brie Perry, Forbes G., 4,691,592, Cl. 74-691.000.

National Semiconductor Corp.: *See—*
Rapp, A. Karl, 4,692,635, Cl. 307-279.000.
Stanojevic, Silvo, 4,692,688, Cl. 323-285.000.

National Starch and Chemical Corporation: *See—*
Mudge, Paul R., 4,692,366, Cl. 428-90.000.
Puletti, Paul P.; and Decowski, Stanley J., Jr., 4,692,161, Cl. 604-366.000.

Nattel, William, to Commander Electrical Materials, Inc. Cable connector. 4,692,561, Cl. 174-65.0SS.

Nattel, William, to Commander Electrical Materials, Inc. Seal for a cable connector. 4,692,562, Cl. 174-65.0SS.

Naus, Peter J. A.: *See—*
Stikvoort, Eduard F.; van Roermund, Arthur H. M.; and Naus, Peter J. A., 4,692,737, Cl. 340-347.0DD.

NCR Corporation: *See—*
Poeppelman, Alan D., 4,692,923, Cl. 371-38.000.

Nebe, Rainer: *See—*
Supp, Armin; and Nebe, Rainer, 4,692,244, Cl. 210-219.000.

NEC Corporation: *See—*
Fukuzo, Yukio; and Inoue, Yasukazu, 4,692,642, Cl. 307-530.000.
Negoro, Tatsuo, 4,692,784, Cl. 357-49.000.
Ohsawa, Tomoki, 4,692,931, Cl. 375-106.000.
Oyamada, Takashi, 4,692,790, Cl. 357-79.000.
Sakuma, Hiraku, 4,692,665, Cl. 315-169.400.

Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek: *See—*
Gelderloos, Pouwel J., 4,691,525, Cl. 62-101.000.

Neeley, Walter P., to Mobil Oil Corporation. Ocean bottom seismometer. 4,692,906, Cl. 367-15.000.
Negoro, Tatsuo, to NEC Corporation. Dielectric insulation type semiconductor integrated circuit having low withstand voltage devices and high withstand voltage devices. 4,692,784, Cl. 357-49.000.
Negron-Crespo, Jorge L. Apparatus for modifying building blocks. 4,691,684, Cl. 125-3.000.
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, to Matsushita Electric Industrial Co., Ltd. Sewing machine control apparatus. 4,691,653, Cl. 112-275.000.
Neles OY: *See—*
Pyotsia, Jousi K.; and Yli-Koski, Esko T., 4,691,894, Cl. 251-127.000.
Nelson, Erik B., to Dowell Schlumberger Incorporated. Novel ferrofluids for use in cementing wells. 4,691,774, Cl. 166-291.000.
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, to Perkin-Elmer Corporation, The. Automatic digital wavelength calibration system for a spectrophotometer. 4,692,883, Cl. 364-571.000.
Nenjukov, Alexandr K.: *See—*
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.
Neri, Armando. Dustproof cabinet, in particular for electrical equipment. 4,691,970, Cl. 312-257.0SK.
Nestec S.A.: *See—*
Bertholet, Raymond, 4,692,534, Cl. 549-456.000.
Netzer, Ronald G. Life support carrying apparatus. 4,691,397, Cl. 5-507.000.
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., to Azdel, Inc. Thermoplastic sheet. 4,692,375, Cl. 428-299.000.
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, to Hilti Aktiengesellschaft. Drill bit chuck for drilling and cutting devices. 4,691,929, Cl. 279-19.300.
New, Bernard J., to Advanced Micro Devices, Inc. Method and apparatus for generating and summing the products of pairs of numbers. 4,692,888, Cl. 364-728.000.
New, Dane S.; and Dove, Albert W. Aquatic sport device. 4,691,658, Cl. 114-66.000.
Newman, Daniel A.: *See—*
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.
Newman, Ira R.: *See—*
Affa, Steven N.; Newman, Ira R.; and Allison, Robert S., 4,691,741, Cl. 138-113.000.
Newman, Paul R.: *See—*
Witucki, Edward F.; Warren, Leslie F., Jr.; and Newman, Paul R., 4,692,225, Cl. 204-59.00R.
Newman, Russell L. Trenching equipment with hinged side plates. 4,691,455, Cl. 37-103.000.
Newmar Corporation: *See—*
Miller, Mahlon A., 4,691,958, Cl. 296-146.000.
News Log International, Inc.: *See—*
Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., 4,692,913, Cl. 369-44.000.
Ngai, Chuck H.; and Watkins, Gerald J., to International Business Machines Corporation. Edge sensitive single clock latch apparatus with a skew compensated scan function. 4,692,633, Cl. 307-269.000.
NGK Insulators, Ltd.: *See—*
Enomoto, Akio, 4,692,581, Cl. 219-10.810.
Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, 4,692,192, Cl. 148-12.70C.
Matsui, Minoru; and Soma, Takao, 4,692,419, Cl. 501-97.000.
Oda, Isao; and Soma, Takao, 4,692,420, Cl. 501-97.000.
NGK Spark Plug Co., Ltd.: *See—*
Kojima, Takio; and Taniguchi, Masato, 4,691,673, Cl. 123-271.000.
Nicholson, John L., to Klargester Environmental Engineering Ltd. Sewage treatment biological rotors. 4,692,241, Cl. 210-150.000.
Niekrasz, Frank; and Menke, Andrew. Glass assembly for refrigerator doors and method of manufacture. 4,691,486, Cl. 52-172.000.
Nifco Inc.: *See—*
Arakawa, Masaru, 4,691,589, Cl. 74-573.00F.
Arakawa, Masaru; and Numata, Masanori, 4,691,811, Cl. 188-290.000.
Kurihara, Kazumasa, 4,691,883, Cl. 248-74.200.
Mizusawa, Akira, 4,691,623, Cl. 98-2.180.
Nakayama, Hiromichi; and Fukuda, Moritoshi, 4,691,416, Cl. 24-90.00B.
Nihei, Masayasu; Suwa, Masateru; and Chigasaki, Mitsuo, to Hitachi, Ltd. Thin film forming method through sputtering and sputtering device. 4,692,230, Cl. 204-192.310.
Nihon Radiator Co., Ltd.: *See—*
Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, 4,691,862, Cl. 237-12.30A.
Nihon Tokushu Noyaku Seizo K.K.: *See—*
Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, 4,692,436, Cl. 514-129.000.
Nikken Chemicals Co., Ltd.: *See—*
Ukigaya, Tadashi; and Ogawa, Keizaburo, 4,692,337, Cl. 424-469.000.
Nilssen, Ole K. Parallel-resonant bridge-inverter fluorescent lamp ballast. 4,692,667, Cl. 315-209.00R.
Nilssen, Ole K. Battery charger with adjustable charging current. 4,692,681, Cl. 320-2.000.
Nilsson, Bengt, to Kamyr AB. Apparatus for producing mechanical pulp with a refiner having its drive shaft connected to a steam turbine output shaft. 4,692,214, Cl. 162-261.000.
Nilsson, Stefan: *See—*
Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, 4,691,556, Cl. 73-12.000.
Nilsson, William B.: *See—*
Spinelli, John; Stout, Virginia F.; and Nilsson, William B., 4,692,280, Cl. 260-420.000.
Ninomiya, Hidetaka: *See—*
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, to Nippon Hoso Kyokai. Bandwidth compressed transmission system. 4,692,801, Cl. 358-133.000.
Nippon Hoso Kyokai: *See—*
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.
Wada, Masatoshi; and Sakai, Tetsuo, 4,692,662, Cl. 313-493.000.
Nippon Kogaku K.K.: *See—*
Kawahara, Atsushi; and Okita, Masaya, 4,692,815, Cl. 358-335.000.
Nippon Paint Co., Ltd.: *See—*
Tsuchiya, Yasuyuki; and Sakamoto, Hiroyuki, 4,692,483, Cl. 523-406.000.
Nippon Petrochemicals Co., Ltd.: *See—*
Hayakawa, Masaru; Yoshida, Takeshi; and Kaiya, Atsushi, 4,691,759, Cl. 164-526.000.
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.
Nippon Steel Corporation: *See—*
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.
Yoshitomi, Yasunari; Kuroki, Katsuro; and Iwayama, Kenzo, 4,692,193, Cl. 148-111.000.
Nippon Telegraph & Telephone Corporation: *See—*
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Nippon Thompson Co., Ltd.: *See—*
Kasai, Naomi, 4,692,037, Cl. 384-44.000.
Kasai, Naomi, 4,692,038, Cl. 384-45.000.
Kawaguchi, Yoshifumi, 4,692,036, Cl. 384-44.000.
Nippondenso Co., Ltd.: *See—*
Kosuge, Shuichi, 4,692,866, Cl. 364-424.100.
Matsuda, Takeshi; Miyamoto, Masasi; and Takei, Toshihiro, 4,692,092, Cl. 415-143.000.
Nishihara, Mikio: *See—*
Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, 4,692,843, Cl. 361-414.000.
Nishikawa, Kazunori: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.
Nishikawa, Masao; and Sakurai, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission with anti creep device. 4,691,596, Cl. 74-869.000.
Nishikawa, Toshio: *See—*
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.
Nishimoto, Naomichi, to Victor Company of Japan, Ltd. Jitter-immune time expansion for time-compressed line-sequential video signals. 4,692,814, Cl. 358-320.000.
Nishimura, Seiichi, to Sanshin Kogy Kabushiki Kaisha. Carburetor icing preventing device. 4,691,671, Cl. 123-73.00V.
Nishimura, Yasumasa: *See—*
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Optical coupler. 4,691,982, Cl. 350-96.120.
Nishiura, Masaharu; and Haruki, Hiromu, to Fuji Electric Corporate Research and Devel., Ltd. Method for gettering heavy metal from a silicon plate. 4,692,345, Cl. 427-39.000.
Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Method of performing solution growth of a GaAs compound semiconductor crystal layer under control of conductivity type thereof. 4,692,194, Cl. 437-120.000.
Nishizawa, Jun-ichi: *See—*
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.
Nissan Motor Co., Ltd.: *See—*
Fujita, Masahiro; and Uemura, Yukio, 4,691,786, Cl. 173-12.000.
Hirabayashi, Yuji; Noguchi, Masato; and Hatanaka, Keiji, 4,691,521, Cl. 60-602.000.
Kikuchi, Kazuhiro, 4,691,676, Cl. 123-399.000.
Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, 4,691,862, Cl. 237-12.30A.
Sato, Yoshimi, 4,691,939, Cl. 280-806.000.
Seko, Yasutoshi; and Abe, Yuichi, 4,692,798, Cl. 358-93.000.
Takizawa, Satoshi, 4,691,812, Cl. 192-3.300.
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.
Ushiro, Masayuki, 4,691,742, Cl. 139-1.00R.

Nissenson, Bilha: *See*—
Shimoni, Yair; Fenster, Paul; and Nissenson, Bilha, 4,692,864, Cl. 364-414.000.
Nix, Hans F., to Elektro-Physik Hans Nix & Dr.-Ing. E. Steingroever K.G. Rolling magnetic probe for continuous thickness measurement. 4,692,700, Cl. 324-229.000.
Noda, Koshi: *See*—
Sakai, Shoji; and Noda, Koshi, 4,691,415, Cl. 19-262.000.
Noda, Yasushi; and Kitahara, Toshihiro, to Teac Corporation. Magnetic disk drive capable of mechanical connection to a data processing instrument without deformation. 4,692,828, Cl. 360-97.000.
Nogi, Masako: *See*—
Tsuda, Tatsuya; and Nogi, Masako, 4,692,597, Cl. 219-492.000.
Noguchi, Masato: *See*—
Hirabayashi, Yuji; Noguchi, Masato; and Hatanaka, Keiji, 4,691,521, Cl. 60-602.000.
Noguchi, Yoshiro: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.
Nomi, Haruo, to Japan Gore-Tex, Inc. Water-vapor-permeable, waterproof, highly elastic films. 4,692,369, Cl. 428-198.000.
Nonoguchi, Hiroshi: *See*—
Fukunaga, Masao; and Nonoguchi, Hiroshi, 4,691,870, Cl. 241-36.000.
Noor, Sybille: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.
Norco,Inc.: *See*—
Metz, Joseph R., 4,692,075, Cl. 411-7.000.
Nord-Plan Stalreoler A/S: *See*—
Larsen, Anders, 4,691,493, Cl. 52-588.000.
Norris, Janice O.: *See*—
Sondergeld, Carl H.; Frisillo, Albert L.; and Norris, Janice O., 4,692,910, Cl. 367-75.000.
North American Philips Corporation: *See*—
Fitzpatrick, Brian J., 4,692,359, Cl. 427-45.100.
Northwest Design Products, Inc.: *See*—
Kirby, Charles A., 4,692,054, Cl. 403-171.000.
Nose, Noriyuki: *See*—
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.
Nottingham, John R.: *See*—
Spirk, John W., Jr.; and Nottingham, John R., 4,692,587, Cl. 219-242.000.
Novak, Gary J., to Borg-Warner Corporation. Load block for chain-belt. 4,692,130, Cl. 474-201.000.
Novits, Michael F.: *See*—
Kmiec, Chester J.; and Novits, Michael F., 4,692,269, Cl. 252-350.000.
Nowak, Frederick H.; and Hovey, Isabel, to Otis Elevator Company. Adaptive assignment of elevator car calls. 4,691,808, Cl. 187-125.000.
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, to TMC Corporation. Ski binding, in particular for use in cross-country skiing. 4,691,936, Cl. 280-615.000.
Nozaki, Mineo: *See*—
Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.
Nukem GmbH: *See*—
Huschelrath, Gerhard; and Diehl, Herbert, 4,692,702, Cl. 324-251.000.
Nukushina, Masanori: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.
Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.
Numata, Ken-ichi: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.
Numata, Masanori: *See*—
Arakawa, Masaru; and Numata, Masanori, 4,691,811, Cl. 188-290.000.
Nussbaum, Marvin, to Stepan Company. Preparation of acyloxy benzene sulfonate. 4,692,279, Cl. 260-402.000.
Nussbaumer, Max. Urine collector for incontinent women having zig-zag walls. 4,692,160, Cl. 604-331.000.
Nystuen, David L., to Ecolab Inc. Volumetric gravity feed liquid dispenser. 4,691,721, Cl. 134-96.000.
Oakes, Martin C., to Y. S. Securities Limited. Fuse for an alternating current power circuit. 4,692,733, Cl. 337-158.000.
Oba, Koichiro, to Hamamatsu Photonics Kabushiki Kaisha. X-ray shadow graph device. 4,692,938, Cl. 378-62.000.
Obana, Hiroshi: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.
Ober, Christopher K.; and Branston, Randolph E., to Xerox Corporation. Preparation of ink jet compositions. 4,692,188, Cl. 106-23.000.
Obermayer, Heinz: *See*—
Biermeier, Johann; and Obermayer, Heinz, 4,692,827, Cl. 360-97.000.
Obosu, Charles B., to Heil-Quaker Corporation. Lanced fin condenser for central air conditioner. 4,691,768, Cl. 165-151.000.
O'Brien, T. B.: *See*—
Reichman, James M.; McDonald, Michael C.; and O'Brien, T. B., 4,691,790, Cl. 175-67.000.
Oda, Isao; and Soma, Takao, to NGK Insulators, Ltd. Silicon nitride sintered body and manufacturing method thereof. 4,692,420, Cl. 501-97.000.
Odebrecht, Wolfgang: *See*—
Grantz, Helmut; and Odebrecht, Wolfgang, 4,691,949, Cl. 292-216.000.
Oehlert, Yves: *See*—
Joly, Jean; and Oehlert, Yves, 4,692,842, Cl. 361-413.000.
Oehling, Karl-Heinz: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.
Officine Galileo S.p.A.: *See*—
Lombardini, Lapo; and Bardi, Gianluca, 4,691,534, Cl. 62-55.500.
Ogata, Masamitsu: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.
Ogawa, Keizaburo: *See*—
Ukigaya, Tadashi; and Ogawa, Keizaburo, 4,692,337, Cl. 424-469.000.
Ogihara, Satoru: *See*—
Shoji, Moritaka; Yamazaki, Takeo; and Ogihara, Satoru, 4,692,735, Cl. 338-21.000.
Oh, Jang K.: *See*—
Oh, Sang S.; and Oh, Jang K., 4,692,647, Cl. 310-212.000.
Oh, Sang S.; and Oh, Jang K. Rotor construction in an induction motor for eliminating rotor reaction. 4,692,647, Cl. 310-212.000.
Ohara, Kenichi: *See*—
Dohi, Takashi; Shibata, Nobuho; and Ohara, Kenichi, 4,692,676, Cl. 318-269.000.
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,691,653, Cl. 112-275.000.
Ohashi, Toshio: *See*—
Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, 4,691,862, Cl. 237-12.30A.
Ohi Seisakusho Co., Ltd.: *See*—
Maekawa, Junichi, 4,691,475, Cl. 49-352.000.
Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, 4,691,584, Cl. 74-471.00R.
Ohmi, Tadahiro: *See*—
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.
Ohmori, Yasuo: *See*—
Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, 4,692,043, Cl. 400-124.000.
Ohno, Tomoyuki: *See*—
Ishihara, Heigo; and Ohno, Tomoyuki, 4,692,378, Cl. 428-340.000.
Ohsawa, Tomoki, to NEC Corporation. Synchronization circuit capable of establishing synchronism even when a sampling rate is invariable. 4,692,931, Cl. 375-106.000.
Ohsugi, Hiroshi: *See*—
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, to Tokyo Kagaku Kikai Kabushiki Kaisha. Optical adapter for a light-wave rangefinder. 4,692,023, Cl. 356-5.000.
Ohtsuka, Yoshimichi: *See*—
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.
OI Forest Products STS Inc.: *See*—
Snyder, Teddy R., 4,691,859, Cl. 229-23.00R.
Oka, Hideo: *See*—
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.
Oka, Masahisa: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.
Okada, Hideya: *See*—
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.
Okada, Shiro: *See*—
Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, 4,691,447, Cl. 34-4.000.
Okada, Tsutomu, to Olympus Optical Co., Ltd. Calculus crushing apparatus. 4,691,705, Cl. 128-328.000.
Okada, Yasuyuki: *See*—
Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,692,757, Cl. 340-721.000.
Okamoto, Toshiaki: *See*—
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.
Okamoto, Yuji: *See*—
Yao, Hiroyuki; and Okamoto, Yuji, 4,691,476, Cl. 49-374.000.
Okamoto, Yukio; and Shinada, Shinichi, to Hitachi, Ltd. Gas-discharge display device. 4,692,666, Cl. 315-169.400.
Oki Electric Industry Co., Ltd.: *See*—
Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, 4,692,043, Cl. 400-124.000.

OKI Electronics Co., Ltd.: *See—*
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,692,725, Cl. 333-203.000.

Okino, Tadashi, to Canon Kabushiki Kaisha. Camera incorporating flash unit. 4,692,013, Cl. 354-413.000.

Okita, Masaya: *See—*
Kawahara, Atsushi; and Okita, Masaya, 4,692,815, Cl. 358-335.000.

Okiyama, Yoichi: *See—*
Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.

Okouchi, Isamu: *See—*
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.

Okubo, Yosiyuki: *See—*
Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, 4,692,663, Cl. 313-495.000.

Okuda, Yukito: *See—*
Ishii, Koji; and Okuda, Yukito, 4,691,631, Cl. 101-218.000.

Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,650, Cl. 310-323.000.

Okumura, Ichiro: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.

Okumura, Masahide: *See—*
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Okuno Chemical Industries Co. Ltd.: *See—*
Wada, Masatoshi; and Sakai, Tetsuo, 4,692,662, Cl. 313-493.000.

Okuno, Itaru: *See—*
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.

Okuno, Takuo, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,672, Cl. 318-116.000.

Okuno, Takuo: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.
Seki, Hiroyuki; and Okuno, Takuo, 4,692,652, Cl. 310-323.000.

Olin Corporation: *See—*
Parthasarathi, Arvind, 4,692,221, Cl. 204-13.000.

Olsen, Ralph A., to Ametek, Inc. Handling system and method for ship construction and repair. 4,692,087, Cl. 414-680.000.

Olson, Daniel H., to Snyder Laboratories, Inc. Lavage/suction tip with dual splash shield. 4,692,140, Cl. 604-40.000.

Olympus Optical Company: *See—*
Sakai, Mitsugu; and Yoshikawa, Shoji, 4,692,606, Cl. 250-205.000.
Takayama, Syuichi, 4,691,706, Cl. 128-328.000.

Olympus Optical Co., Ltd.: *See—*
Fujibayashi, Kenji, 4,692,818, Cl. 360-22.000.
Okada, Tsutomu, 4,691,705, Cl. 128-328.000.
Takahara, Masayuki; and Momoki, Motoyasu, 4,692,824, Cl. 360-85.000.

Omata, Hiroyasu: *See—*
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.

Omnium de Traitements et de Valorisation (O.T.V.): *See—*
Levasseur, Jean-Pierre, 4,692,167, Cl. 44-2.000.

Omron Tateisi Electronics Co.: *See—*
Fukui, Ryoichi; and Minamikawa, Susumu, 4,692,034, Cl. 374-208.000.
Maenishi, Kozo; and Nakanishi, Youichi, 4,692,728, Cl. 335-192.000.

Ono, Kouichi: *See—*
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.

Onoda Cement Co., Ltd.: *See—*
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Onodera, Kaoru: *See—*
Sasaki, Masao; Kadowaki, Takashi; and Onodera, Kaoru, 4,692,399, Cl. 430-507.000.

Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, to Onoda Cement Co., Ltd.; and Sankyo Dengyo Co., Ltd. Apparatus for controlling the operation of a grinding system. 4,691,869, Cl. 241-34.000.

Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, to Fujitsu Limited. Semiconductor memory device having block pairs. 4,692,900, Cl. 365-63.000.

Oomori, Tatsuo: *See—*
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.

Oono, Akihiro: *See—*
Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, 4,691,796, Cl. 180-142.000.

Oosawa, Tetsuo: *See—*
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.

Ooyama, Mitsuo: *See—*
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Opdahl, Barry J.: *See—*
Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., 4,691,985, Cl. 350-96.180.

Optech Inc.: *See—*
LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, 4,692,607, Cl. 250-205.000.

Optimol-Oelwerke GmbH: *See—*
Matzat, Norbert; and Schreiber, Hans, 4,692,255, Cl. 252-51.50A.

Orii, Kohei: *See—*
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.

Orin Chemical Company: *See—*
Wright, Thomas C.; and Johnson, Grover L., 4,692,473, Cl. 521-72.000.

Orion-yhtyma Oy: *See—*
Kinanen, Ilmari; and Ranne, Sulo, 4,691,595, Cl. 74-798.000.

Orlans, Itzhak, to Amiad Sinun Vehashkaya. Fluid filtering device. 4,692,247, Cl. 210-314.000.

Osada, Toshiyuki: *See—*
Saitoh, Michihiro; Gogami, Takatoshi; and Osada, Toshiyuki, 4,692,799, Cl. 358-106.000.

Osaka Trunk Material Co., Ltd.: *See—*
Murase, Mikio, 4,691,540, Cl. 70-68.000.

Osborne, Jon L., to Exxon Nuclear Company, Inc. Spacer capture rod to space grid attachment device. 4,692,303, Cl. 376-446.000.

Osborne, Lyle E. Hydraulic brake system. 4,691,520, Cl. 60-593.000.

OSG Mfg. Company: *See—*
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Osinga, Halbe, to U.S. Philips Corporation. Composite wire, coil and deflection unit for HF applications. 4,692,731, Cl. 335-299.000.

Ostwald, Robert; and Voit, Gabriele, to Licentia Patent-Verwaltungs-GmbH. Process for metallizing a solid body. 4,692,356, Cl. 427-304.000.

Ota, Hiroshi, to TDK Corporation. Magnetic recording medium and process for producing the same. 4,692,377, Cl. 428-323.000.

Ota, Yoshihiro: *See—*
Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, 4,692,573, Cl. 200-50.00C.

Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, to Hitachi, Ltd. Method and apparatus for removing extraneous matters. 4,692,253, Cl. 210-791.000.

Otis Elevator Company: *See—*
Nowak, Frederick H.; and Hovey, Isabel, 4,691,808, Cl. 187-125.000.

Otis Engineering Corporation: *See—*
Dollison, William W., 4,691,511, Cl. 60-414.000.
Gano, John C., 4,691,781, Cl. 166-368.000.
Williamson, Jimmie R., Jr., 4,691,777, Cl. 166-319.000.

Otobe, Takashi: *See—*
Ito, Yujiro; Kamatsu, Yasutoshi; and Otobe, Takashi, 4,692,721, Cl. 333-109.000.

Otsuka, Hirotaka: *See—*
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Otsuka, Shojiro; and Komada, Hideaki, to Diesel Kiki Co., Ltd. Multi-stage fuel injection system for internal combustion engines. 4,691,674, Cl. 123-299.000.

Ott, Russell G., to RCA Corporation. Multiple byte serial data transfer protocol. 4,692,859, Cl. 364-200.000.

Otteman, John H.; and Lufkin, John R. Engine overheat protection system. 4,691,669, Cl. 123-41.150.

Ottieri Enterprises: *See—*
Ottieri, Marco T., 4,691,454, Cl. 36-117.000.

Ottieri, Marco T., to Ottieri Enterprises. Ski boot closure system. 4,691,454, Cl. 36-117.000.

Otto, Wilheim, to Blohm & Voss AG. Method and apparatus for the performance testing of the engine of a ship while the engine is installed in the hull of a ship. 4,691,560, Cl. 73-116.000.

Otto, William F.: *See—*
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.

Ouyang, Kenneth W.; and Marmet, Melvin, to Western Digital Corporation. Voltage controlled oscillator with high speed current switching. 4,692,717, Cl. 331-111.000.

Overlach, Knud: *See—*
Pietzsch, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, 4,692,943, Cl. 382-8.000.

Owada, Toshiro; Kosugi, Kenichi; and Nagase, Yasuo, to Ministry of International Trade & Industry; and Agency of Industrial Science & Technology. Device for turning over book leaves. 4,691,909, Cl. 270-58.000.

Owens-Illinois, Inc.: *See—*
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

Oxoid Limited: *See—*
Webster, Martyn F., 4,692,417, Cl. 436-518.000.

Oy Wartsila Ab: *See—*
Pousar, Kurt, 4,691,955, Cl. 294-142.000.

Tomma, Kauko, 4,691,488, Cl. 52-223.00R.
Oya, Tetsuro: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.
Oyamada, Takashi, to NEC Corporation. Structure for connecting leadless chip carrier. 4,692,790, Cl. 357-79.000.
Ozasa, Susumu: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Ozeki, Jiro, to Slidex Corporation. Information recording carrier-holding frame. 4,691,826, Cl. 206-456.000.
Packaging Systems International, Inc.: *See*—
Danforth, Ronald V.; and Pleau, Medric H., 4,691,500, Cl. 53-478.000.
Packard, Douglas T.; and Schmitt, Donald E., to United States of America, National Aeronautics and Space Administration. Brushless DC motor control system responsive to control signals generated by a computer or the like. 4,692,674, Cl. 318-254.000.
Pagani, Hermes: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.
Pagano, Amleto, to SETEC s.r.l. Safety lock with plural tumblers, having a shaped consent stud. 4,691,545, Cl. 70-352.000.
Paikert, Paul: *See*—
Wurz, Dieter; and Paikert, Paul, 4,691,766, Cl. 165-135.000.
Palmer, Forrest M. Two-drum, two-layer continuous meld-casting method. 4,691,758, Cl. 164-461.000.
Pannwitz, Karl-Heinz, to Dragerwerk AG. Diffusion sample collector for gaseous media. 4,692,309, Cl. 422-87.000.
Pape, Kenneth R. Golf bag insert. 4,691,823, Cl. 206-315.600.
Paper Converting Machine Company: *See*—
Bradley, John J., 4,691,908, Cl. 270-21.100.
Paramount Fitness Corporation: *See*—
Voris, Harvey C., 4,691,916, Cl. 272-118.000.
Parduhn, A. Philip. Golf bag support. 4,691,884, Cl. 248-96.000.
Parisi, Tulio T., to Ultramed Corporation. Lens cleaner. 4,691,725, Cl. 134-184.000.
Parker Hannifin Corporation: *See*—
Church, John F.; and Stone, Walter H., 4,692,245, Cl. 210-232.000.
Parker, Wesley A.; Hardesty, Donald E.; and Stanley, Jack E., to Shell Oil Company. Selective placement of fluid injection in a riser reactor equipped with a horizontal tee joint connection to substantially reduce back pressure in the riser reactor. 4,692,235, Cl. 208-113.000.
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., to Shell Oil Company. Apparatus for the separation of fluid cracking catalyst particles from gaseous hydrocarbons. 4,692,311, Cl. 422-144.000.
Parkinson, William S.; and Djerf, Villy E., to Bunker Plastics, Inc. Ceiling and wall tile. 4,692,372, Cl. 428-282.000.
Parma Corporation: *See*—
Rogers, Walter C., Jr.; and Holobaugh, Raymond E., 4,691,961, Cl. 297-61.000.
Parnoff, George K.: *See*—
Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., 4,692,621, Cl. 250-343.000.
Parsons, Donald F., to Communications Test Design, Inc. Switch testing. 4,692,939, Cl. 379-16.000.
Parsons, Michael, to Teledyne Canada Limited. Material handling system. 4,692,085, Cl. 414-633.000.
Parsons, William H.; and Patchett, Arthur A., to Merck & Co., Inc. Benzofused lactams useful as cholecystokinin antagonists. 4,692,522, Cl. 540-523.000.
Parthasarathi, Arvind, to Olin Corporation. In-situ dendritic treatment of electrodeposited foil. 4,692,221, Cl. 204-13.000.
Partis, Richard A.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,692,552, Cl. 562-475.000.
Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., to Andros Anlayzers Incorporated. Digital anesthetic agent analyzer. 4,692,621, Cl. 250-343.000.
Pastor, Stephen D.: *See*—
Spivack, John D.; Ravichandran, Ramanathan; and Pastor, Stephen D., 4,692,532, Cl. 548-312.000.
Pastorino, Ronald L.; and Bock, Lawrence A., to Witco Corporation. Dispersions and the preparation of foamed resins therefrom. 4,692,427, Cl. 502-160.000.
Patchett, Arthur A.: *See*—
Parsons, William H.; and Patchett, Arthur A., 4,692,522, Cl. 540-523.000.
Patenaude, Jean-Pierre. Gas powered soldering iron. 4,691,691, Cl. 126-414.000.
Paternoster, Manuela: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.
Paul, Terrance D.: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.
Pauley, Barry W.: *See*—
Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., 4,691,789, Cl. 175-62.000.
Paust, Joachim: *See*—
Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, 4,692,527, Cl. 544-405.000.
Payne, Thomas R., to General Electric Company. Power control arrangement for automatic surface unit. 4,692,596, Cl. 219-450.000.
Peachtree Doors, Inc.: *See*—
Governale, Bernard C., 4,691,477, Cl. 49-380.000.
Peck, Paul L., to Archery Designs, Inc. Bow string release. 4,691,683, Cl. 124-35.00A.
Peco Controls Corporation: *See*—
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.
Pecsok, Roger L., to Pennwalt Corporation. Foamable polyvinylidene fluoride and methods. 4,692,381, Cl. 428-375.000.
Pedain, Josef; Konig, Klaus; and Schonfelder, Manfred, to Bayer Aktiengesellschaft. Polyester polyols and their use as polyol component in two component polyurethane lacquers. 4,692,384, Cl. 428-423.300.
Peddinghaus, Rolf. Method of sawing a steel structural shape having at least one flange. 4,691,601, Cl. 83-56.000.
Peel, Robert M.; and Darner, John T. Golf practice device. 4,691,922, Cl. 273-177.00B.
Peer, A. Dean, Jr., to Adolph Coors Company. Milk carton blank and milk carton with pour spout. 4,691,858, Cl. 206-621.200.
Peerless Machine & Tool Corporation: *See*—
Carmichael, Kenneth, 4,691,604, Cl. 83-164.000.
Peleg, Amiram: *See*—
Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.
Pellegrino, Damian: *See*—
Pellegrino, Peter P.; and Pellegrino, Damian, 4,692,222, Cl. 204-15.000.
Pellegrino, Peter P.; and Pellegrino, Damian. Electroplating method and apparatus for electroplating high aspect ratio thru-holes. 4,692,222, Cl. 204-15.000.
Penman, Alistair: *See*—
Irvine, Sheila M.; Penman, Alistair; and Wood, Geoffrey B., 4,692,338, Cl. 426-2.000.
Pennwalt Corporation: *See*—
Bloomfield, Philip E.; and Preis, Seymour, 4,692,285, Cl. 264-22.000.
Georgiev, Vassil S.; and Mullen, George B., 4,692,515, Cl. 540-203.000.
Kmiec, Chester J.; and Novits, Michael F., 4,692,269, Cl. 252-350.000.
Pecsok, Roger L., 4,692,381, Cl. 428-375.000.
Pensar Corporation: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.
Percival, Richard; and Uhlmann, Ernst, to Lasarray Holding AG. Method of making electrically conductive regions in monolithic semiconductor devices as applied to a semiconductor device. 4,691,434, Cl. 437-173.000.
Perdue Incorporated: *See*—
Risser, Dale M.; and Lease, Michael E., 4,691,410, Cl. 17-11.000.
Perez, Juan M.: *See*—
Wendling, Robert W.; Kurtz, John W.; and Perez, Juan M., 4,691,886, Cl. 248-183.000.
Perez, Leon A.: *See*—
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.
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Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.
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Pettersson, Ingvar, to Scomas AB. Method and apparatus for indicating and sensing pipetting positions. 4,692,609, Cl. 250-221.000.

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Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

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Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,692,218, Cl. 203-19.000.

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Zimmer, Gabriele, 4,692,155, Cl. 604-177.000.

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Phelps Dodge Industries, Inc.: *See—*
Kauffman, John C., 4,692,566, Cl. 174-117.0FF.

Phelps, Warren C. Gun sling. 4,691,852, Cl. 224-150.000.

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Porter, Randall A.; and Reed, Larry E., 4,692,234, Cl. 208-48.0AA.
Welch, M. Bruce, 4,692,430, Cl. 502-342.000.
Wood, Roy F., 4,691,740, Cl. 138-109.000.

Phillips, Robert R.: *See—*
Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., 4,692,268, Cl. 252-33.400.

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Picmausova, Dagmar: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

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Pietzsch, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, to Dr. Ludwig Pietzsch GmbH. Method of and system for optoelectronic inspection of a two-dimensional pattern on an object. 4,692,943, Cl. 382-8.000.

Piher Navarra, S.A.: *See—*
Lopez, Carlos; and Serrano, Jose L., 4,692,805, Cl. 338-198.000.

Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, to General Electric Company. Hybrid extended drain concept for reduced hot electron effect. 4,691,433, Cl. 437-44.000.

Pinkerton, Michael B.; and Moskowitz, David. Safety covers for electric outlets. 4,691,974, Cl. 439-147.000.

Pinsak, George F.; and Morton, Henry H., Jr. Apparatus for deterring thumbsucking. 4,692,748, Cl. 340-573.000.

Pioneer Electronic Corporation: *See—*
Shimizu, Tetsuo, 4,692,708, Cl. 328-63.000.

Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, to Gruppo Lepetit S.p.A. Antimicrobial and antitumor antibiotic M 9026 and its pure individual factors 1, 2, and 3 and microbial process for production thereof. 4,692,333, Cl. 424-122.000.

Pitches, Brian E.; and Wright, David A., to Ferranti plc. Three-dimensional position measuring apparatus. 4,691,446, Cl. 33-516.000.

Pitney Bowes Inc.: *See—*
Manduley, Flavio, 4,692,870, Cl. 364-466.000.

Piulle, Walter V.: *See—*
Gelfand, Peter C.; Piulle, Walter V.; and Rettenmaier, Louis F., 4,692,174, Cl. 55-129.000.

Pleau, Medric H.: *See—*
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Plessey Overseas Limited: *See—*
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Taylor, Peter J.; Clarke, Alan; and Thompson, John S., 4,691,510, Cl. 60-39.094.

Pochmarski, Luzian: *See—*
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Poduje, Noel S., to ADE Corporation. Conductivity-type sensor. 4,692,695, Cl. 324-158.00R.

Poeppelman, Alan D., to NCR Corporation. Fault tolerant memory. 4,692,923, Cl. 371-38.000.

Polanschutz, Wolfgang; Pochmarski, Luzian; and Moser, Alfred, to Voest-Alpine Aktiengesellschaft. Arrangement provided at a continuous casting plant. 4,691,757, Cl. 164-416.000.

Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., to United States Steel Corporation. Method for controlling heat input into a coke oven. 4,692,216, Cl. 201-1.000.

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Kee, Richard C., 4,692,807, Cl. 358-229.000.
Kimball, Philip M., 4,692,776, Cl. 346-140.00R.

Poli, Gary N.: *See—*
Georgiou, George E.; and Poli, Gary N., 4,692,349, Cl. 437-230.000.

Poling, Denzil C. Hydraulic control valve. 4,691,618, Cl. 91-326.000.

Politis, Demetrios T.; and Licata, William H., to Environmental Research Institute of Michigan. Adaptive learning controller for synthetic aperture radar. 4,692,765, Cl. 342-106.000.

Polizzotti, Richard S.: *See—*
Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., 4,692,428, Cl. 502-254.000.

Polyplastics Co., Ltd.: *See—*
Takahashi, Katsuhiko; and Sugita, Michiyuki, 4,692,480, Cl. 523-218.000.

Pomagalski: *See—*
Brochand, Max, 4,691,643, Cl. 104-202.000.

Poole, John D., to Westinghouse Brake and Signal Co., Ltd. Brake control system. 4,692,867, Cl. 364-426.000.

Porsch, Bedrich; Voslar, Jaroslav; and Rosol, Jaroslav, to Ceskoslovenska akademie ved. Column for liquid chromatography. 4,692,243, Cl. 210-198.200.

Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., to Minnesota Mining and Manufacturing Company. Transparent sheets containing directional images and method for forming the same. 4,691,993, Cl. 350-105.000.

Porter, Randall A.; and Reed, Larry E., to Phillips Petroleum Company. Antifoulants for thermal cracking processes. 4,692,234, Cl. 208-48.0AA.

Portolese, Larry A.; and Leathers, Thomas M., to Allied Corporation. Constant percentage flow divider. 4,691,730, Cl. 137-101.000.

Possley, Glen G.; and Wilson, Earl C., to Texas Instruments Incorporated. Programmable read-only-memory element with polycrystalline silicon layer. 4,692,787, Cl. 357-59.000.

Post Brothers Construction Co.: *See—*
Post, Charles R., 4,691,785, Cl. 172-212.000.

Post, Charles R., to Post Brothers Construction Co. Reversible plow and carriage. 4,691,785, Cl. 172-212.000.

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Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, 4,692,732, Cl. 335-302.000.

Potts, Gerald R.; and Ryder, John C., to G. R. Potts Associates, Inc. High speed tire uniformity testing device. 4,691,564, Cl. 73-146.000.

Pousar, Kurt, to Oy Wartsila Ab. Rigid place mat. 4,691,955, Cl. 294-142.000.

Powell, Philip E., to Advanced Cardiovascular Systems, Inc. Self-venting balloon dilatation catheter and method. 4,692,200, Cl. 156-289.000.

Powers, Dale R.: *See—*
Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., 4,692,615, Cl. 250-231.00R.

Poyer, David D. Outdoor lighting fixture with U-shaped fluorescent lamp. 4,692,848, Cl. 362-216.000.

Poyner, John C., to GTE Products Corporation. Motor vehicle headlight with self-centering lug assembly. 4,692,656, Cl. 313-113.000.

Pozsgai, Istvan: *See—*
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

PPG Industries, Inc.: *See—*
Das, Suryya K.; and Kania, Charles M., 4,692,503, Cl. 526-301.000.
Gillery, F. Howard; and Criss, Russell C., 4,692,389, Cl. 428-622.000.
Iwanski, Donald P., 4,692,335, Cl. 424-149.000.
Ranka, Ajay I.; and Das, Suryya K., 4,692,491, Cl. 524-458.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.
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PRC Corporation: *See—*
Weiss, Hardy P., 4,692,928, Cl. 372-63.000.

Precision Fukuhara Works, Ltd.: *See—*
Yorisue, Shozo; and Morimoto, Seiji, 4,691,536, Cl. 66-168.000.

Preis, Seymour: *See—*
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Preston, Brian C.: *See—*
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Price, J. B.; and Wu, Schyi-Yi, to Spectrum CVD, Inc. Plasma enhanced CVD. 4,692,343, Cl. 427-38.000.

Price, P. Michael: *See*—
Schmidt, E. Michael; and Price, P. Michael, 4,691,424, Cl. 29-261.000.
Pringle, David A.: *See*—
LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, 4,692,607, Cl. 250-205.000.
Pringle, Ronald E., to Camco, Incorporated. Retrievable well safety valve with expandable external seals. 4,691,776, Cl. 166-319.000.
Pritchard, James W.: *See*—
Haefling, James F.; Pritchard, James W.; and Stierman, Roger J., 4,691,854, Cl. 228-4.500.
Procter & Gamble Company, The: *See*—
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.
Janusz, John M., 4,692,512, Cl. 530-801.000.
Siklosi, Michael P., 4,692,277, Cl. 252-558.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Vinatier, Bernard, 4,692,295, Cl. 264-291.000.
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Leclaire, Charly, 4,691,652, Cl. 112-262.100.
Prulhiere, Jean-Paul, to Commissariat a l'Energie Atomique. Electronic apparatus for detecting stray variations in an electrical voltage as a function of time. 4,692,692, Cl. 324-102.000.
Pryor, Timothy R., to Diffracto, Ltd. Remote operation of optical system. 4,692,884, Cl. 364-573.000.
Pugh, James G.; Johnson, Duane R.; and Bartholomew, Roy E., to Allied Corporation. Dual circuit brake valve. 4,691,968, Cl. 303-52.000.
Puletti, Paul P.; and Decowski, Stanley J., Jr., to National Starch and Chemical Corporation. Hot melt adhesive waste barrier. 4,692,161, Cl. 604-366.000.
Pulse Electronics, Inc.: *See*—
Martin, Gregory C., 4,691,563, Cl. 73-129.000.
Pulz, Otto: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.
PUMA AG Rudolf Dassler Sport: *See*—
Adam, Gunter, 4,691,926, Cl. 273-73.00J.
Purkott, Hans D., to Arkansas Precision Hydraulics, Inc. Multi-section sweep cycle compaction cylinder. 4,691,617, Cl. 91-167.00R.
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Reid, Edward A.; Cook, F. Bert; and Purvis, Edgar M., 4,691,532, Cl. 62-476.000.
Pyne, R. David G. Downhole water flow controller for aquifer storage recovery wells. 4,691,778, Cl. 166-320.000.
Pyotsia, Jousi K.; and Yli-Koski, Esko T., to Neles OY. Valve. 4,691,894, Cl. 251-127.000.
Quantum Corporation: *See*—
Campbell, Steve G., 4,692,829, Cl. 360-105.000.
Quinn, Patrick A., to Tektronix, Inc. Differential impedance neutralization circuit. 4,692,712, Cl. 330-261.000.
Rabeyrolles, Serge, to Commissariat a l'Energie Atomique. Apparatus for measuring low currents with high dynamics. 4,692,693, Cl. 324-123.00R.
Rabushka, Charles; and Reprogle, Layton J. Tension actuated uncoupler. 4,691,941, Cl. 285-1.000.
Radiation Dynamics, Inc.: *See*—
Stine, Clifford R., 4,691,782, Cl. 168-12.000.
Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Floor of electrically heated melting furnace, particularly a direct current furnace. 4,692,930, Cl. 373-72.000.
Raduchel, Bernd: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.
Raesner, Dennis L.: *See*—
Person, Herman R.; Raesner, Dennis L.; and Meints, Gayle L., 4,692,655, Cl. 313-15.000.
Ragen, Peter D. Circular plant mobile. 4,691,473, Cl. 47-67.000.
Raidel, John E. Vehicle suspension assembly. 4,691,937, Cl. 280-711.000.
Raizen, David T.; and Wilmot, Richard A. Security system with correlated signalling to selected satellite stations. 4,692,742, Cl. 340-539.000.
Raj, Kuldip; and Casciari, Raoul, to Ferrofluidics Corporation. Bearing assembly with integrated ferrofluid seal. 4,692,826, Cl. 360-97.000.
Ramuz, Henri: *See*—
Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, 4,692,450, Cl. 514-256.000.
Randall, Beryl D.: *See*—
Jansen, Norman A.; and Randall, Beryl D., 4,691,806, Cl. 187-9.00R.
Rangaswamy, Subramaniam; and Harrington, John H., to Perkin-Elmer Corporation. Corrosion and wear resistant alloy. 4,692,305, Cl. 420-436.000.
Rangert, Bo R.: *See*—
Andreasson, Bo C.; and Rangert, Bo R., 4,692,753, Cl. 340-671.000.
Ranka, Ajay I.; and Das, Suryya K., to PPG Industries, Inc. Polymer emulsion products. 4,692,491, Cl. 524-458.000.
Ranne, Sulo: *See*—
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Rapp, A. Karl, to National Semiconductor Corp. Self-timed logic level transition detector. 4,692,635, Cl. 307-279.000.
Rasberger, Michael; Dubs, Paul; and Evans, Samuel, to Ciba-Geigy Corporation. Tetrahydroquinolines as antioxidants for lubricants. 4,692,258, Cl. 252-50.000.
Rautenberg, Jurgen: *See*—
Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, 4,692,301, Cl. 376-391.000.
Ravichandran, Ramanathan: *See*—
Spivack, John D.; Ravichandran, Ramanathan; and Pastor, Stephen D., 4,692,532, Cl. 548-312.000.
Raychem Corporation: *See*—
Koht, Lowell; and Shimirak, Gerald L., 4,692,565, Cl. 174-93.000.
Raytheon Company: *See*—
Galani, Zvi, 4,692,714, Cl. 331-1.00R.
Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., to General Motors Corporation. Airfoil for high efficiency/high lift fan. 4,692,098, Cl. 416-223.00R.
RCA Corporation: *See*—
Anderson, Charles H.; and Carlson, Curtis R., 4,692,806, Cl. 358-209.000.
Botez, Dan, 4,692,925, Cl. 372-46.000.
Hoover, Alan A., 4,692,852, Cl. 363-21.000.
Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., 4,692,344, Cl. 427-39.000.
Keeler, Brian G.; and Whitley, George J., 4,691,419, Cl. 29-39.000.
Krufka, Frank S., 4,692,605, Cl. 250-201.000.
McNeely, David L., 4,692,889, Cl. 364-730.000.
Miller, Louis D.; and Kaiser, Donald B., 4,692,658, Cl. 313-365.000.
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Realex Corporation: *See*—
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Reckziegel, Erich; and Holzapfel, Heinz, to Henkel Kommanditgesellschaft auf Aktien. Process for nonslip finishing of smooth surfaces of objects and objects produced thereby. 4,692,370, Cl. 428-198.000.
Redford, Peter M.; and Redford, Rita A., to Trillian Computer Corporation. Visual interface between user and computer system. 4,692,858, Cl. 364-200.000.
Redford, Rita A.: *See*—
Redford, Peter M.; and Redford, Rita A., 4,692,858, Cl. 364-200.000.
Redshaw, Sally: *See*—
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Reed International plc: *See*—
Graham, Thomas; Perrins, Leslie A.; and Morris, Kevin, 4,691,838, Cl. 220-93.000.
Reed, Joseph C. Toothbrush having adjustable bristle-mounted tabs. 4,691,405, Cl. 15-201.000.
Reed, Larry E.: *See*—
Porter, Randall A.; and Reed, Larry E., 4,692,234, Cl. 208-48.0AA.
Rees, James D.: *See*—
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Reese, Walter J.: *See*—
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., 4,692,375, Cl. 428-299.000.
Reeve, Michael H.; and Cassidy, Stephen A., to British Telecommunications. Optical fibre transmission line. 4,691,896, Cl. 254-134.400.
Regie Nationale des Usines Renault: *See*—
Bascou, Jacques, 4,691,581, Cl. 74-30.000.
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,691,597, Cl. 74-869.000.
Reich, Shymon, to Du Pont de Nemours, E. I., and Company. Sintering of metal interlayers within organic polymeric films. 4,692,387, Cl. 428-545.000.
Reichel, Gilbert, administrator: *See*—
Reichel, Paul, deceased; and Reichel, Gilbert, administrator, 4,692,722, Cl. 333-142.000.
Reichel, Paul, deceased; and Reichel, Gilbert, administrator, to Loral Corporation. Compact frequency dispersive bulk acoustic wave channelizer. 4,692,722, Cl. 333-142.000.
Reichman, James M.; McDonald, Michael C.; and O'Brien, T. B., to Flowdril Corporation. Method and apparatus for removing the inner conduit from a dual passage drill string. 4,691,790, Cl. 175-67.000.
Reid, Donald E., to Hercules Incorporated. Metallizable polypropylene film. 4,692,380, Cl. 428-349.000.
Reid, Edward A.; Cook, F. Bert; and Purvis, Edgar M., to Columbia Gas System Service Corp. Dual cooling/heating system energy recovery. 4,691,532, Cl. 62-476.000.
Reid, Robert A.: *See*—
Goodnow, Ronald F.; and Reid, Robert A., 4,691,406, Cl. 15-256.530.
Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
Grabowski, Robert; and Kramer, Walter, 4,692,106, Cl. 425-66.000.
Reinhard, Donnie K.: *See*—
Roppel, Thaddeus A.; Asmussen, Jes; and Reinhard, Donnie K., 4,691,662, Cl. 118-50.100.
Reini, George I.: *See*—
Boecker, Wolfgang D. G.; and Reini, George I., 4,692,418, Cl. 501-90.000.
Reiss, Harald; and Ziegenbein, Botho, to Brown, Boveri & Cie AG. Thermal insulation. 4,692,363, Cl. 428-36.000.
Remley, Gilbert W.: *See*—
Crew, Albert W.; Ghrist, William D., III; and Remley, Gilbert W., 4,692,299, Cl. 376-216.000.

Remmele Engineering, Inc.: *See—*
Zastrow, Thomas S., 4,691,906, Cl. 269-48.100.

Rendek, Peter M., to Motorola, Inc. Semi-conductor accelerometer. 4,691,568, Cl. 73-517.00R.

Rennie, Lyall: *See—*
Sloan, Alex; and Rennie, Lyall, 4,691,407, Cl. 15-339.000.

Repligen Corporation: *See—*
Farrell, Roberta L., 4,692,413, Cl. 435-278.000.

Reprogle, Layton J.: *See—*
Rabushka, Charles; and Reprogle, Layton J., 4,691,941, Cl. 285-1.000.

Repta, A. J.: *See—*
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Research Association of Electric Conductive Inorganic Compounds: *See—*
Sekido, Satoshi; Tachibana, Hirokazu; and Yamamura, Yasuharu, 4,692,429, Cl. 502-303.000.

Rettenmaier, Louis F.: *See—*
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Reuter, Alfred, to Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck". Tree-trunk sawing and cutting installation. 4,691,749, Cl. 144-39.000.

Rexnord Inc.: *See—*
Harmon, Raymond E., 4,691,952, Cl. 292-341.180.

Rezabek, Karel: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Rheinmetall GmbH: *See—*
Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, 4,691,636, Cl. 102-387.000.

Rheon Automatic Machinery Co., Ltd.: *See—*
Hayashi, Torahiko; and Tashiro, Yasunori, 4,692,109, Cl. 425-308.000.
Hayashi, Torahiko, 4,692,110, Cl. 425-335.000.
Morikawa, Michio; and Hayashi, Torahiko, 4,692,107, Cl. 425-140.000.

Rhodes, Jerry P.: *See—*
Ebaugh, Roger L.; and Rhodes, Jerry P., 4,692,040, Cl. 384-484.000.

Rhone-Poulenc Chimie de Base: *See—*
Gresser, Robert, 4,692,264, Cl. 252-140.000.

Rice, Douglas N.: *See—*
Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.

Rice, Mark; and Meisner, Douglas, to Interscan, Incorporated. Video viewfinder system. 4,692,006, Cl. 354-75.000.

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Acocella, Richard A., 4,691,609, Cl. 84-322.000.

Richards, Peter S. Joint construction and overhead hanger. 4,691,889, Cl. 248-343.000.

Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., to Methane Drainage Ventures. Process for establishing a clear horizontal borehole in a subterranean formation. 4,691,789, Cl. 175-62.000.

Richter, Gerhard; and Barten, Axel. Rolling mill stand for strip-shaped material. 4,691,548, Cl. 72-21.000.

Richter, Mark A., to United States of America, Army. Method of making a thermally stable composite honeycomb panel. 4,692,367, Cl. 428-116.000.

Rickert, Robert G.: *See—*
McBride, Donald G.; and Rickert, Robert G., 4,692,346, Cl. 427-8.000.

Ricoh Company, Ltd.: *See—*
Tsujihara, Sotohiro, 4,692,020, Cl. 355-14.0SH.

Rideout, Darryl; Kappas, Attallah; and Drummond, George S., to Rockefeller University, The. Therapeutic use of tin diiododeuteroporphyrin. 4,692,439, Cl. 514-185.000.

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Riley, Clifford; and Mears, Christopher J., to Vickers, PLC. Automatic chemical analysis. 4,692,308, Cl. 422-65.000.

Riley, William D.; and Brown, Robert D., Jr., to United States of America, Interior. Metal alloy identifier. 4,692,875, Cl. 364-497.000.

Ring, Michael: *See—*
Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., 4,692,212, Cl. 162-206.000.

Risser, Dale M.; and Lease, Michael E., to Perdue Incorporated. Gizzard harvester. 4,691,410, Cl. 17-11.000.

Rite-Hite Corporation: *See—*
Hahn, Norbert, 4,692,755, Cl. 340-687.000.

Ritenour, Paul E. Low noise fan. 4,692,091, Cl. 415-119.000.

Rizzi, George P.: *See—*
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.

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Frantz, Virgil L., 4,692,175, Cl. 55-218.000.

Roberson, Jerry L. Therapy table with feet anchor apparatus. 4,691,919, Cl. 272-145.000.

Robert Bosch GmbH: *See—*
Falk, Gerhard, 4,692,675, Cl. 318-254.000.
Grunwald, Werner; and Schmid, Kurt, 4,692,657, Cl. 313-130.000.
Hafele, Walter; and Schenk, Bernhard, 4,692,102, Cl. 417-296.000.

Roberts, Donald R., to DeSoto, Inc. Epoxy-phosphate/phenolic electrocoating compositions. 4,692,484, Cl. 523-414.000.

Roberts, Gary F., to Kartridg Pak Co., The. Apparatus for making filled food articles. 4,691,627, Cl. 99-450.600.

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Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., to United States of America, Army. Precision laser beam positioner and spatially resolved laser beam sampling meter. 4,692,623, Cl. 250-349.000.

Roberts, William B.: *See—*
Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., 4,692,098, Cl. 416-223.00R.

Robertshaw Controls Company: *See—*
Sliger, Boyd P.; and Wagner, Joseph P., 4,691,861, Cl. 236-34.500.

Robertson, John W., Jr.: *See—*
Wroblewski, David J.; and Robertson, John W., Jr., 4,692,933, Cl. 377-29.000.

Robinson, John C.: *See—*
Lavendel, Henry W.; and Robinson, John C., 4,692,388, Cl. 428-621.000.

Robinton, Michael A., to Robinton Products, Inc. Adaptive communication network and method. 4,692,761, Cl. 340-825.010.

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Robinton, Michael A., 4,692,761, Cl. 340-825.010.

Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Furniture hinge having a resilient catch and spacer mechanism. 4,691,408, Cl. 16-241.000.

Rock, Erich; and Schwarzler, Felix, to Julius Blum Gesellschaft m.b.H. Extension pull-out guide assembly for drawers. 4,692,035, Cl. 384-18.000.

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Kappas, Attallah; and Drummond, George S., 4,692,440, Cl. 514-185.000.
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Rockwell, Gary L., to Diversified Products Corporation. Multiple exercise device. 4,691,918, Cl. 272-134.000.

Rockwell International Corporation: *See—*
Witucki, Edward F.; Warren, Leslie F., Jr.; and Newman, Paul R., 4,692,225, Cl. 204-59.00R.

Rodgers, Charles E.; and Rodgers, Herman R. Attachment for a back hoe bucket. 4,692,089, Cl. 414-724.000.

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Rodgers, Charles E.; and Rodgers, Herman R., 4,692,089, Cl. 414-724.000.

Roeschlau, Peter: *See—*
Becker, Udo; and Roeschlau, Peter, 4,692,406, Cl. 435-13.000.

Rogers Corporation: *See—*
Gordon, Herman B., 4,691,972, Cl. 439-77.000.
Simpson, Scott, 4,692,476, Cl. 521-112.000.

Rogers, Raymond E.: *See—*
Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., 4,692,621, Cl. 250-343.000.

Rogers, Walter C., Jr.; and Holobaugh, Raymond E., to Parma Corporation. Recliner with headrest. 4,691,961, Cl. 297-61.000.

Rohrbach, Peter; and Benzak, William, to SI Handling Systems, Inc. Vehicle accumulation system. 4,691,641, Cl. 104-166.000.

Rokicki, Stanley. Sliding door assembly with mullion lock. 4,691,474, Cl. 49-220.000.

Rolfs, John C., deceased; and by Rolfs, Margaret H., executrix. Linearizer frequency discriminator for frequency modulated radar transmitters. 4,692,766, Cl. 342-200.000.

Rolfs, Margaret H., executrix: *See—*
Rolfs, John C., deceased; and Rolfs, Margaret H., executrix, 4,692,766, Cl. 342-200.000.

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Denning, Ralph M., 4,691,877, Cl. 244-6.000.

Roman, Ronald J., to L-Bar Products Incorporated. Water-activated, exothermic chemical deicing formulations. 4,692,259, Cl. 252-70.000.

Roos, Hans, to Deutsche Filterbau GmbH. Process for cleaning filter elements. 4,692,173, Cl. 55-96.000.

Roppel, Thaddeus A.; Asmussen, Jes; and Reinhard, Donnie K., to Michigan State University. Dual plasma microwave apparatus and method for treating a surface. 4,691,662, Cl. 118-50.100.

Rorer Pharmaceutical Corporation: *See—*
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,692,445, Cl. 514-212.000.

Rosado, Serafin M. Thermodynamic process for a practical approach to the Carnot cycle. 4,691,523, Cl. 60-649.000.

Rose, Leslie C.: *See—*
Ware, Charles H.; and Rose, Leslie C., 4,691,771, Cl. 166-245.000.

Rosenberg, Helmut W. G.; and Drach, George W., to Kendall Company, The. Catheter with removable connector. 4,692,149, Cl. 604-99.000.

Rosenthal, Robert D., to Trebor Industries, Inc. Near infrared measuring instrument with sample holder. 4,692,620, Cl. 250-343.000.

Rosheim, Mark E., to Sperry Corporation. Superconducting connector. 4,691,973, Cl. 439-161.000.

Rosol, Jaroslav: *See—*
Porsch, Bedrich; Voslar, Jaroslav; and Rosol, Jaroslav, 4,692,243, Cl. 210-198.200.

Rossmann, Axel; and Huther, Werner, to MTU Motoren-und Turbinen-Union Munchen GmbH. Method of hot isostatic pressing of a porous silicon ceramic compact. 4,692,288, Cl. 264-56.000.

Roth, G. Thomas: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Rothbarth, James N.; and Smith, Edward W., to Satellite Technology Services, Inc. Antenna dish reflector with integral azimuth track. 4,692,771, Cl. 343-882.000.

Roucek, Joseph A.; and Tessier, James R., to International Business Machines Corporation. Repair of strip conductor on electrical circuit board. 4,691,426, Cl. 29-402.180.

Rountree, Robert N.; and Herndon, Troy H., to Texas Instruments Incorporated. Semiconductor device with electrostatic discharge protection. 4,692,781, Cl. 357-23.130.

Rouws, Petrus L. A., to U.S. Philips Corporation. Disc-record player comprising a disc-loading mechanism and disc-holder for use in such a player. 4,692,916, Cl. 369-75.200.

Rovera, Giovanni D.: *See*—
De Marchi, Andrea; and Rovera, Giovanni D., 4,692,716, Cl. 331-3.000.

Rowland, Donald G.; Hunter, Byron A.; and Hansen, Lee D., to Uniroyal Chemical Company, Inc. Blowing agent composition. 4,692,475, Cl. 521-92.000.

Roy, Prodyot, to General Electric Company. Method and system for hydrogen thermal-electrochemical conversion. 4,692,390, Cl. 429-17.000.

Roza, Engel; and Van Veenendaal, Hendrik G., to U.S. Philips Corporation. Tunable astable multivibrator with buffer transistors. 4,692,718, Cl. 331-113.00R.

Rubin, Kenneth. Orbit clock. 4,692,032, Cl. 368-76.000.

Rubloff, Gary W.; and Wittmer, Marc F., to International Business Machines Corporation. Low temperature shallow doping technique. 4,692,348, Cl. 437-82.000.

Rudolph, Thomas E., to Eidos Corporation. Avian decoy covering. 4,691,464, Cl. 43-3.000.

Ruka, Roswell J.: *See*—
Isenberg, Arnold O.; and Ruka, Roswell J., 4,692,274, Cl. 252-521.000.

Rumpp, Gerhard: *See*—
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, 4,691,929, Cl. 279-19.300.

Rumsey, John: *See*—
Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, 4,692,017, Cl. 355-3.0DD.

Rupprechter, Helmut: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,691,408, Cl. 16-241.000.

Rust, Ulrich, to SKW Trostberg Aktiengesellschaft. Process for the determination of cyanamide in plants and plant parts. 4,692,415, Cl. 436-20.000.

Ryabikov, Stanislav V.: *See*—
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Antihypertensive agents. 4,692,437, Cl. 514-165.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Antihypertensive agents. 4,692,458, Cl. 514-362.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Antihypertensive agents. 4,692,459, Cl. 514-362.000.

Ryder, John C.: *See*—
Potts, Gerald R.; and Ryder, John C., 4,691,564, Cl. 73-146.000.

Ryobi Ltd.: *See*—
Ishii, Koji; and Okuda, Yukito, 4,691,631, Cl. 101-218.000.

Ryohei, Yamamoto; Shigeki, Kimura; and Akira, Matsuura, to Amano Pharmaceutical Co., Ltd. Process for accelerating antigen-antibody reaction. 4,692,330, Cl. 424-85.000.

Ryuzono, Akira: *See*—
Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, 4,692,935, Cl. 378-49.000.

S&C Electric Company: *See*—
Swanson, Roy T., 4,692,577, Cl. 200-151.000.
Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., 4,692,734, Cl. 337-162.000.

Sabnani, Krishan K.: *See*—
Dahbura, Anton T.; and Sabnani, Krishan K., 4,692,921, Cl. 371-27.000.

Sachdev, Harbans S.: *See*—
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.

Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., to International Business Machines Corporation. Silicon-containing polyimides as oxygen etch stop and dual dielectric coatings. 4,692,205, Cl. 156-643.000.

Sadler, Thomas H., to Manville Corporation. Continuously variable transmission pulley. 4,692,128, Cl. 474-8.000.

Saeki, Keiji: *See*—
Maeda, Yukio; Kudo, Shinichi; and Saeki, Keiji, 4,692,351, Cl. 427-196.000.

Safarik, William F., to Garrett Corporation, The. Ram air turbine. 4,692,093, Cl. 416-1.000.

Sagalevich, Valery M.: *See*—
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.

Saines, Marius: *See*—
Landau, Boris; and Saines, Marius, 4,692,157, Cl. 604-214.000.

St. Clair, David J.: *See*—
Samuelson, Gay M.; and St. Clair, David J., 4,692,557, Cl. 136-251.000.

Saint-Gobain Vitrage: *See*—
Villain, Jean-Marie; and Fremaux, Jacques, 4,692,180, Cl. 65-32.000.

St. Onge, Henri S. Apparatus for cathodic protection of metal piping. 4,692,231, Cl. 204-197.000.

Saito, Asao; and Watanabe, Kunio, to Canon Kabushiki Kaisha. Image forming method using image forming elements having different concentrations and pitches. 4,692,773, Cl. 346-1.100.

Saito, Mitsuo: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Saito, Shinji: *See*—
Tanaka, Sumio; Saito, Shinji; and Atsumi, Shigeru, 4,692,902, Cl. 365-210.000.

Saito, Suzuo: *See*—
Kuroiwa, Akihiko; and Saito, Suzuo, 4,692,855, Cl. 363-95.000.

Saito, Tutomu: *See*—
Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, 4,692,812, Cl. 358-285.000.

Saitoh, Michihiro; Gogami, Takatoshi; and Osada, Toshiyuki, to Showa Electric Wire & Cable Co., Ltd. Automatic inspection system for detecting foreign matter. 4,692,799, Cl. 358-106.000.

Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Corporation. Electron beam lithography apparatus. 4,692,579, Cl. 250-492.200.

Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, to Matsushita Electric Industrial Co., Ltd. Polygon mirror construction. 4,691,998, Cl. 350-616.000.

Sakai, Mitsugu; and Yoshikawa, Shoji, to Olympus Optical Company. Modulated light source with power stabilized according to data signal. 4,692,606, Cl. 250-205.000.

Sakai, Shoji; and Noda, Koshi, to Murata Kikai Kabushiki Kaisha. Roller of draft apparatus. 4,691,415, Cl. 19-262.000.

Sakai, Tetsuo: *See*—
Wada, Masatoshi; and Sakai, Tetsuo, 4,692,662, Cl. 313-493.000.

Sakakibara, Yuji: *See*—
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Sakama, Mitsunori: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Sakamoto, Hiroyuki: *See*—
Tsuchiya, Yasuyuki; and Sakamoto, Hiroyuki, 4,692,483, Cl. 523-406.000.

Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, to Hitachi, Ltd. Method of processing a plurality of code systems. 4,692,896, Cl. 364-900.000.

Sakuma, Hiraku, to NEC Corporation. Driving method for driving plasma display with improved power consumption and driving device for performing the same method. 4,692,665, Cl. 315-169.400.

Sakuma, Shuji; and Fujinawa, Hirotaka, to Kabushiki Kaisha Sangi. Toothbrush. 4,691,718, Cl. 132-84.00R.

Sakurai, Koichi; and Kojima, Minoru. Head-positioning mechanism for an endless tape. 4,692,820, Cl. 360-74.700.

Sakurai, Yoshimi: *See*—
Nishikawa, Masao; and Sakurai, Yoshimi, 4,691,596, Cl. 74-869.000.

Sales, Andre : *See*—
Garcia, Raoul; Michaux, Daniel; and Sales, Andre , 4,691,724, Cl. 134-169.00R.

Salton, Robert B.: *See*—
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.

Samhwa Electric Industrial Co.: *See*—
Chung, Ki Ho, 4,692,833, Cl. 361-91.000.

Sampedro, Manuel, to Sampedro, Manuel; and Kohuth, Russell T., a part interest to each. Direct drive fan coupling assembly. 4,692,053, Cl. 403-24.000.

Samuel, Michael. Wheeled vehicle. 4,691,930, Cl. 280-7.100.

Samuelson, Gay M.; and St. Clair, David J., to Shell Oil Company. Encapsulated solar cell assemblage and method of making. 4,692,557, Cl. 136-251.000.

Sanden Corporation: *See*—
Ikeda, Hideo, 4,691,527, Cl. 62-234.000.
Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, 4,691,447, Cl. 34-4.000.

Sander, Wilfried; Essig, Gunder; and Wacker, Erich, to Metallgesellschaft Aktiengesellschaft. Light alloy piston. 4,691,622, Cl. 92-233.000.

Sanders Associates, Inc.: *See*—
Lalmond, Richard G., 4,692,683, Cl. 322-2.00R.
Vanetik, Anatoly; and Preston, Brian C., 4,691,605, Cl. 83-175.000.

Sandor, Jules A. Quick disconnect battery terminal. 4,691,980, Cl. 439-476.000.

Sandoz Ltd.: *See*—
Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., 4,692,544, Cl. 560-4.000.
Seiler, Max P., 4,692,453, Cl. 514-290.000.

Sankar, Pat V., to University of California, The Regents of the. AM/FM hybrid ultrasonic imaging. 4,691,707, Cl. 128-660.000.

Sankyo Dengyo Co., Ltd.: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Sano, Yasuro, to Janome Sewing Machine Co. Ltd. Mechanism for producing stitched patterns in a zigzag sewing machine. 4,691,655, Cl. 112-466.000.

Sanshin Kogy Kabushiki Kaisha: *See*—
Nishimura, Seiichi, 4,691,671, Cl. 123-73.00V.

Santambrogio, Alberto; and Mattei, Luciano, to Agip Petroli, S.p.A. Chemical compounds to be used as solid carriers for fuel additives. 4,692,170, Cl. 44-63.000.

Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, to SKF Steel Engineering AB; and Stora Kopparbergs Bergslags AB. Recovery of chemicals from pulp waste liquor. 4,692,209, Cl. 162-30.100.

Santulli, Scott: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Sanyo Electric Co.: *See*—
Imaizumi, Norio, 4,692,670, Cl. 315-388.000.

Sarssi, Pekka: *See*—
Mann, Yale; and Sarssi, Pekka, 4,691,801, Cl. 180-287.000.

Sasaki, Hiroyuki; and Hanzawa, Kohtaro, to Casio Computer Co., Ltd. Waveform normalizer for electronic musical instrument. 4,691,608, Cl. 84-1.010.

Sasaki, Masao; Kadowaki, Takashi; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,692,399, Cl. 430-507.000.

Sasaki, Toshimi: *See*—
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Sase, Akira: *See*—
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC.

Sashin, Donald; and Sternglass, Ernest J., to University of Pittsburgh. Radiography apparatus and method. 4,692,937, Cl. 378-062.000.

Sasib S.p.A.: *See*—
Gianese, Goffredo, 4,691,848, Cl. 222-269.000.

Satellite Technology Services, Inc.: *See*—
Rothbarth, James N.; and Smith, Edward W., 4,692,771, Cl. 343-882.000.

Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, to Nippon Petrochemicals Company, Limited. Surface active agent. 4,692,270, Cl. 252-353.000.

Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, to Catalysts & Chemicals Industries Co., Inc. Catalytic cracking process for heavy oil with mixture of alumina and zeolite. 4,692,236, Cl. 208-114.000.

Sato, Hiroshi: *See*—
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.

Sato, Kohei: *See*—
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.

Sato, Masayoshi: *See*—
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.

Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Semiconductor integrated circuit device. 4,692,904, Cl. 365-226.000.

Sato, Noritada: *See*—
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, 4,692,782, Cl. 357-29.000.

Sato, Ray S., to Magnetic Massage Company. Massage device. 4,691,693, Cl. 128-24.100.

Sato, Ryosuke: *See*—
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.

Sato, Takuro: *See*—
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,692,725, Cl. 333-203.000.

Sato, Takuso; and Ichida, Nobuyuki, to Fujitsu Limited. Apparatus for observing sound field of ultrasonic wave. 4,691,569, Cl. 73-596.000.

Sato, Yoshimi, to Nissan Motor Company, Limited. Release system for seat occupant in vehicle. 4,691,939, Cl. 280-806.000.

Satoh, Atsushi: *See*—
Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Sutoh, Junichi, 4,692,422, Cl. 501-136.000.

Sauer, Joachim: *See*—
Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, 4,691,813, Cl. 192-13.00R.

Sauerwein, Kurt; Kinzer, Norbert; and Mick, Felix W., to Sauerwein, Kurt. Pipeline switch. 4,692,628, Cl. 250-497.100.

Sautter, Sieghart: *See*—
Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, 4,691,422, Cl. 29-149.50B.

Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, to Hitachi, Ltd. Light emitting device with improved electrode structure to minimize short circuiting. 4,692,927, Cl. 372-46.000.

Sburlati, Luigi; Acuto, Giovanni; and Stacchino, Giuseppe, to Fiat Auto S.p.A. Unit for connecting a seat to motor vehicle floor. 4,691,946, Cl. 248-429.000.

Schaeffer, Eric S., to General Motors Corporation. High/low DC voltage motor vehicle electrical system. 4,692,684, Cl. 322-90.000.

Scharf, Stephen. Combination base board/corner & floor brush holder. 4,691,403, Cl. 15-114.000.

Schave, Floyd D., to Crafco, Inc. Sealant melter/applicator with automatic load switching system. 4,692,028, Cl. 366-22.000.

Schenk, Bernhard: *See*—
Hafele, Walter; and Schenk, Bernhard, 4,692,102, Cl. 417-296.000.

Schenk, Mark B.: *See*—
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

Scherbatskoy, Serge A. Methods and apparatus for reducing interfering effects in measurement while drilling operations. 4,692,911, Cl. 367-83.000.

Scherer, Richard M., to Stratus Corporation. Liquid heater with closed loop heat transfer system. 4,691,666, Cl. 122-33.000.

Schering Aktiengesellschaft: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Schiel, Christian; and Kotitschke, Herbert, to J.M. Voith GmbH. Stone pressure roll for a web of fibers. 4,691,420, Cl. 29-116.00R.

Schiel, Christian, to J. M. Voith GmbH' . Press roll with adjustable sag. 4,691,421, Cl. 29-116.0AD.

Schiele, Herbert: *See*—
Alstetter, Franz; Schiele, Herbert; Sedlmayer, Peter; and Hultsch, Gunther, 4,691,448, Cl. 34-8.000.

Schindler, Edgar C. Wrap-around packaging. 4,691,824, Cl. 206-315.900.

Schinkel, Ingo; and Bohner, Jurgen, to Wolff Walsrode Aktiengesellschaft. Sealable multilayer polyolefin films. 4,692,386, Cl. 428-515.000.

Schinner, Edward N.: *See*—
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.

Schirmer, Ulrich: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.

Schleuniger, Kurt; and Hermann, Peter, to Strausak AG. Method of testing the mechanical stress resistance of a sample of material and apparatus for carrying out the method. 4,691,576, Cl. 73-821.000.

Schliebs, Bjorn: *See*—
Illy, Hugo; Schliebs, Bjorn; and Hess, Wilhelm, 4,692,540, Cl. 558-78.000.

Schloegl, Gunter: *See*—
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,692,837, Cl. 361-313.000.

Schlonski, James S.; and Burnett, Tobias W. T., to Westinghouse Electric Corp. Control of nuclear reactor power plant on occurrence of rupture in coolant tubes. 4,692,297, Cl. 376-211.000.

Schlosser, Ewald: *See*—
Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, 4,692,926, Cl. 372-46.000.

Schlossman, Stuart: *See*—
Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, 4,692,405, Cl. 435-7.000.

Schlueter, Edward. Punch and ejector assembly. 4,691,602, Cl. 83-128.000.

Schlumberger-Doll Research: *See*—
Ekstrom, Michael P.; and Havira, R. Mark, 4,692,908, Cl. 367-27.000.

Schlumberger Technology Corporation: *See*—
Locke, Stanley; and Gouilloud, Michel, 4,692,707, Cl. 324-374.000.

Schmelzer Corporation: *See*—
DeLand, Daniel L.; and LaVene, Leon F., 4,691,943, Cl. 285-315.000.

Schmetz, Peter-Nikolaus; and Klocker, Peter, to Ferdinand Bernhard Schmetz, Firma. Needle package. 4,691,825, Cl. 206-380.000.

Schmid, Kurt: *See*—
Grunwald, Werner; and Schmid, Kurt, 4,692,657, Cl. 313-130.000.

Schmid Laboratories: *See*—
Gordon, Harry W., 4,692,334, Cl. 424-122.000.

Schmidt, E. Michael; and Price, P. Michael, to Harte Industries, Inc. Pipe cap extractor apparatus. 4,691,424, Cl. 29-261.000.

Schmidt, Timothy J.: *See*—
Fisher, Alfred J., III; and Schmidt, Timothy J., 4,692,294, Cl. 264-259.000.

Schmitt, Donald E.: *See*—
Packard, Douglas T.; and Schmitt, Donald E., 4,692,674, Cl. 318-254.000.

Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., to PPG Industries, Inc. Elastomeric coating compositions. 4,692,382, Cl. 428-414.000.

Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; and Tetenbaum, Marvin T., to PPG Industries, Inc. Polycarbonate based elastomeric coating compositions. 4,692,383, Cl. 428-414.000.

Schmitt, Wilfried: *See*—
Schorr, Manfred; and Schmitt, Wilfried, 4,692,523, Cl. 540-533.000.

Schmitz, Wolfgang. Appliance for partially dyeing the hair. 4,691,720, Cl. 132-112.000.

Schmutz, Friedrich: *See—*
Mierswa, Christian; and Schmutz, Friedrich, 4,691,723, Cl. 134-167.00C.

Schneider, Gottlieb: *See—*
Tauscher, Willy; and Schneider, Gottlieb, 4,692,030, Cl. 366-337.000.

Schneider, James T.; and Haugse, Albert L., to Ashland Oil, Inc. Self-setting urethane adhesive paste system. 4,692,479, Cl. 523-209.000.

Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., to Sud-Chemie Aktiengesellschaft. Catalyst for reducing the nitrogen oxide content of flue gases. 4,692,425, Cl. 502-81.000.

Schneider, Theodor: *See—*
Bauer, Kurt; and Schneider, Theodor, 4,692,677, Cl. 318-443.000.

Schnell, Axel: *See—*
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,692,289, Cl. 264-61.000.

Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, to Hochtemperatur-Reaktorbau GmbH. Steam generator heated with the cooling gas of a nuclear reactor. 4,692,301, Cl. 376-391.000.

Scholem, Paul. Portable steel target for pistol shooting. 4,691,925, Cl. 273-407.000.

Scholer, Jurgen: *See—*
Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, 4,691,422, Cl. 29-149.50B.

Scholles, Herbert: *See—*
Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, 4,691,636, Cl. 102-387.000.

Scholtes, Ronald P.: *See—*
Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., 4,692,571, Cl. 200-5.00A.

Schonfelder, Manfred: *See—*
Pedain, Josef; Konig, Klaus; and Schonfelder, Manfred, 4,692,384, Cl. 428-423.300.

Schonherr, Erich: *See—*
Betz, Thomas; von Schnering, Hans-Georg; and Schonherr, Erich, 4,692,203, Cl. 156-610.000.

Schorr, Manfred; and Schmitt, Wilfried, to Hoechst Aktiengesellschaft. Process for the preparation of 1-substituted aza-cycloalkan-2-ones. 4,692,523, Cl. 540-533.000.

Schourup, William E.: *See—*
Studer, Robert L.; and Schourup, William E., 4,691,726, Cl. 137-15.000.

Schramm, Charles H. Non-alkaline, foamable bathroom cleaner. 4,692,276, Cl. 252-545.000.

Schreiber, Hans: *See—*
Matzat, Norbert; and Schreiber, Hans, 4,692,255, Cl. 252-51.50A.

Schreinemacher, Herbert: *See—*
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,692,289, Cl. 264-61.000.

Schuchardt, Gunter: *See—*
Black, Karl-Heinz; and Schuchardt, Gunter, 4,692,669, Cl. 315-381.000.

Schuh, Rudolf, to Mead Corporation, The. Product retard device for drop-loading packaging machine. 4,691,495, Cl. 53-48.000.

Schultz, Jerald. Lug wrench extension handle. 4,691,599, Cl. 81-177.200.

Schulze, Jurgen: *See—*
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Schumann, Klaus: *See—*
Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, 4,692,260, Cl. 252-99.000.

Schupphaus, Herbert, to Gebr. Eickhoff Maschinenfabrik and Eisengiesserei m.b.H. Apparatus for controlling the discharge of pressurized liquid from nozzles on a cutting drum of a mining machine. 4,691,967, Cl. 299-1.000.

Schuster, Hans D.: *See—*
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.

Schwab, Wilfried: *See—*
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.

Schwartz, Thomas W., to Minnesota Mining and Manufacturing Company. Dispensing container. 4,691,845, Cl. 222-94.000.

Schwartz, Walter. Golf game apparatus. 4,691,923, Cl. 273-180.000.

Schwarzler, Felix: *See—*
Rock, Erich; and Schwarzler, Felix, 4,692,035, Cl. 384-18.000.

Schweiger, Raimund: *See—*
Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, 4,691,636, Cl. 102-387.000.

Schwerdtle, Friedhelm: *See—*
Bieringer, Hermann; and Schwerdtle, Friedhelm, 4,692,181, Cl. 71-86.000.

Schwitters, Wayne J., to WIC, Inc. Apparatus for defoliating sugar beets and the like utilizing flexible flails with rigid cutting members at the free ends thereof. 4,691,506, Cl. 56-121.400.

Schwitters, Wayne J., to WIC, Inc. Polyurethane flail for use in defoliating sugar beets and the like. 4,691,507, Cl. 56-121.400.

Scientific Atlanta, Inc.: *See—*
West, Lamar E., Jr., 4,692,919, Cl. 370-96.000.

Scomas AB: *See—*
Pettersson, Ingvar, 4,692,609, Cl. 250-221.000.

Scott & Fetzer Company, The: *See—*
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.

Scott, James W.; and Hickox, John. Orthopedic cast spacing and spreading device. 4,691,699, Cl. 128-91.00A.

Scott, Michael J., to Allflex International Limited. Tags. 4,691,458, Cl. 40-300.000.

SCP Biscornet: *See—*
Garcia, Raoul; Michaux, Daniel; and Sales, Andre , 4,691,724, Cl. 134-169.00R.

Seacliff International, Inc.: *See—*
Sherer, Paul, 4,692,680, Cl. 320-2.000.

Sebo, Milan J., to Allied Corporation. Brake control valve. 4,691,737, Cl. 137-625.260.

Secemski, Isaac I.; and Lynn, Jesse L., Jr., to Lever Brothers Company. Detergent compositions containing an alkylbenzene sulfonate and alcohol ethoxysulfate surfactant system. 4,692,275, Cl. 252-534.000.

Security Tag Systems, Inc.: *See—*
Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., 4,692,746, Cl. 340-572.000.

Sedgewick, Richard D. Flat windings, coil forms, and winding method. 4,691,746, Cl. 140-92.100.

Sedlmayer, Peter: *See—*
Alstetter, Franz; Schiele, Herbert; Sedlmayer, Peter; and Hultsch, Gunther, 4,691,448, Cl. 34-8.000.

Seely, James R.: *See—*
Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, 4,691,892, Cl. 248-624.000.

Seiko Epson Kabushiki Kaisha: *See—*
Nakagawa, Hitoshi; and Kitahara, Kohei, 4,691,911, Cl. 271-9.000.

Seiko Instruments & Electronics Ltd.: *See—*
Morita, Yoshiyuki, 4,692,568, Cl. 178-19.000.

Seikosha Co., Ltd.: *See—*
Kaneko, Koichi; and Hanya, Masado, 4,692,031, Cl. 368-18.000.

Seiler, Max P., to Sandoz Ltd. Pharmaceutical active 1,2,3,4,4A,5,10,-10A-octahydrobenzo[g] quinoline derivatives, and their use. 4,692,453, Cl. 514-290.000.

Seki, Hiroyuki; and Okuno, Takuo, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,652, Cl. 310-323.000.

Seki, Hiroyuki: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, to Fuji Electric Corporate Research & Development Co., Ltd. Semiconductor radioactive ray detector. 4,692,782, Cl. 357-29.000.

Sekido, Satoshi; Tachibana, Hirokazu; and Yamamura, Yasuharu, to Research Association of Electric Conductive Inorganic Compounds. Catalyst composition and multi-functional sensor. 4,692,429, Cl. 502-303.000.

Sekine, Yoshitada: *See—*
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Seko, Yasutoshi; and Abe, Yuichi, to Nissan Motor Company, Limited. Apparatus and process for improving visibility of object within visual field. 4,692,798, Cl. 358-93.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Sendelbach, Lee A.: *See—*
Fawcett, Bradley W.; and Sendelbach, Lee A., 4,692,758, Cl. 340-735.000.

Senger, Detlef: *See—*
Pietzsch, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, 4,692,943, Cl. 382-8.000.

Sengoku, Yoshinari: *See—*
Tamura, Takahiko; and Sengoku, Yoshinari, 4,692,793, Cl. 358-29.000.

Sentrol, Inc.: *See—*
Abel, William E., 4,692,752, Cl. 340-604.000.

Serrano, Jose L.: *See—*
Lopez, Carlos; and Serrano, Jose L., 4,692,805, Cl. 338-198.000.

SETEC s.r.l.: *See—*
Pagano, Amleto, 4,691,545, Cl. 70-352.000.

Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, to Honda Giken Kogyo K.K.; and Honda Manufacturing Co., Ltd. Fuse circuit unit for combination with an electromagnetic switch. 4,692,835, Cl. 361-104.000.

Sevcik, Bohumil: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Seymour, Paul F. Unifastener. 4,692,055, Cl. 403-190.000.

Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., to GTE Products Corporation. Fiber optic connector. 4,691,985, Cl. 350-96.180.

Shappir, Joseph: *See—*
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,691,433, Cl. 437-44.000.

Sharp Kabushiki Kaisha: *See—*
Iwai, Shiyougo, 4,692,022, Cl. 355-24.000.
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,692,206, Cl. 156-649.000.
Nakao, Motokazu, 4,692,795, Cl. 358-75.000.
Suzuki, Takashi, 4,691,713, Cl. 128-736.000.
Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, 4,692,025, Cl. 356-45.000.
Tsuda, Tatsuya; and Nogi, Masako, 4,692,597, Cl. 219-492.000.
Washizuka, Isamu; and Kinugawa, Kiyoshi, 4,692,740, Cl. 340-365.00R.

Shaud, Ronald J. Snow shovel. 4,691,954, Cl. 294-54.500.

Shaw, John H.: *See—*
Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., 4,691,987, Cl. 350-96.230.

Shaw, Richard G.: *See—*
Bahl, Surinder K.; Canterino, Peter J.; and Shaw, Richard G., 4,692,496, Cl. 525-240.000.

Shea, John R., Jr. Joint seal assembly. 4,691,489, Cl. 52-235.000.

Shell Offshore Inc.: *See—*
Wankmuller, Richard N., 4,692,064, Cl. 405-211.000.

Shell Oil Company: *See—*
Drent, Eit, 4,692,548, Cl. 560-202.000.
Frank, Harry, 4,692,504, Cl. 528-89.000.
Holscher, Hugo, 4,691,524, Cl. 60-652.000.
Parker, Wesley A.; Hardesty, Donald E.; and Stanley, Jack E., 4,692,235, Cl. 208-113.000.
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.
Samuelson, Gay M.; and St. Clair, David J., 4,692,557, Cl. 136-251.000.
van den Berg, Wilhemus H.; Homs, Marinus H.; and van Oorschot, Bob P. J., 4,691,572, Cl. 73-643.000.

Shelton, Thomas V.: *See—*
Kerr, Jack R.; Shelton, Thomas V.; and Dunsmore, Jerry L., 4,692,077, Cl. 411-206.000.

Shenvi, Ashokkumar B., to Du Pont de Nemours, E. I., and Company. Intermediates for octahydrobenzc[uro[3,2-e]isoquinolines. 4,692,528, Cl. 546-115.000.

Shepherd, Charles G.; and Travale, Samuel, to B. D. Wait Co. Limited. One piece adjustable damper. 4,691,689, Cl. 126-295.000.

Sherer, Paul, to Seacliff International, Inc. Portable battery charging apparatus and methods therefor. 4,692,680, Cl. 320-2.000.

Sherrill, Jimmy L.: *See—*
Howard, H. Keith; and Sherrill, Jimmy L., 4,692,599, Cl. 219-532.000.

Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., to Westinghouse Electric Corp. Mechanical spectral shift reactor. 4,692,296, Cl. 376-209.000.

Shibamoto, Takeshi: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.

Shibata, Nobuho: *See—*
Dohi, Takashi; Shibata, Nobuho; and Ohara, Kenichi, 4,692,676, Cl. 318-269.000.
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,691,653, Cl. 112-275.000.

Shigeki, Kimura: *See—*
Ryohei, Yamamoto; Shigeki, Kimura; and Akira, Matsuura, 4,692,330, Cl. 424-85.000.

Shih-Cheng, Tseng. Portable and simple barbecue spit structure. 4,691,626, Cl. 99-421.00H.

Shih, Kwang K.: *See—*
Aviram, Ari; and Shih, Kwang K., 4,692,044, Cl. 400-241.100.

Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, to Hitachi, Ltd. Fully automatic washing machine. 4,691,538, Cl. 68-12.00R.

Shikata, Hiroshi, to Kabushiki Kaisha Toshiba. Cutting tool. 4,692,070, Cl. 407-104.000.

Shimada, Fumio: *See—*
Toyoda, Yasuhiro; Shimada, Fumio; and Yoshida, Katsumi, 4,692,009, Cl. 354-246.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,692,131, Cl. 474-80.000.

Shimirak, Gerald L.: *See—*
Koht, Lowell; and Shimirak, Gerald L., 4,692,565, Cl. 174-93.000.

Shimizu, Tetsuo, to Pioneer Electronic Corporation. Time base correction circuit. 4,692,708, Cl. 328-63.000.

Shimoni, Yair; Fenster, Paul; and Nissenson, Bilha, to Elscint Ltd. Method of determining stenosis of blood vessels. 4,692,864, Cl. 364-414.000.

Shimotaka, Hisakuni: *See—*
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,691,499, Cl. 53-451.000.

Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, to Kobishi Electric Co., Ltd. Motor actuated buzzer assembly with a plurality of leaf springs of different frequencies. 4,692,741, Cl. 340-392.000.

Shin, Kju H., to Ethyl Corporation. Preparation of diphenolics. 4,692,555, Cl. 568-722.000.

Shinada, Shinichi: *See—*
Okamoto, Yukio; and Shinada, Shinichi, 4,692,666, Cl. 315-169.400.

Shintani, Fumio, to Kabushiki Kaisha Komatsu Seisakusho. Method and apparatus for measuring net weight of load loaded on vehicle. 4,691,792, Cl. 177-1.000.

Shiokawa, Youichi: *See—*
Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, 4,692,444, Cl. 514-406.000.

Shiragami, Kazuharu: *See—*
Moriya, Mitsuro; Shiragami, Kazuharu; and Yamaguchi, Hiroyuki, 4,692,915, Cl. 369-53.000.

Shirahata, Kunikatsu: *See—*
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Shoji, Masakazu, to AT&T Bell Laboratories. CMOS logic circuit with single clock pulse. 4,692,637, Cl. 307-443.000.

Shoji, Moritaka; Yamazaki, Takeo; and Ogihara, Satoru, to Hitachi, Ltd. Nonlinear voltage dependent resistor and method for manufacturing thereof. 4,692,735, Cl. 338-21.000.

Short, Robert E.: *See—*
Elkins, William; Connell, Eugene W.; and Short, Robert E., 4,691,762, Cl. 165-46.000.

Showa Denko Kabushiki Kaisha: *See—*
Watanabe, Yoji; Morimura, Toshio; and Toyoda, Yukio, 4,692,313, Cl. 422-241.000.

Showa Electric Wire & Cable Co., Ltd.: *See—*
Saitoh, Michihiro; Gogami, Takatoshi; and Osada, Toshiyuki, 4,692,799, Cl. 358-106.000.

Shur-lok International S.A.: *See—*
Dessouroux, Alexis A. J., 4,692,078, Cl. 411-231.000.

Shuster, Louis: *See—*
Dodman, Nicholas H.; and Shuster, Louis, 4,692,451, Cl. 514-282.000.

Shvartsman, Vladimir A., to Electronic Design & Research, Inc. Parallel input signal processor for low-level signal, high-noise environments. 4,692,709, Cl. 328-108.000.

Shvartsman, Vladimir A., to Electronic Design & Research, Inc. Fundamental and harmonic pulse-width discriminator. 4,692,710, Cl. 328-111.000.

SI Handling Systems, Inc.: *See—*
Rohrbach, Peter; and Benzak, William, 4,691,641, Cl. 104-166.000.

Siac Industria Accessori Cavaria S.p.A.: *See—*
Vaglini, Franco, 4,691,437, Cl. 29-753.000.

Siemens Aktiengesellschaft: *See—*
Auracher, Franz, 4,692,720, Cl. 333-33.000.
Biermeier, Johann; and Obermayer, Heinz, 4,692,827, Cl. 360-97.000.
Conrad, Bernhard; and Tressl, Guenther, 4,692,813, Cl. 358-294.000.
Gaul, Hartmut; Mickal, Hermann; and Haboeck, Adolf, 4,692,632, Cl. 307-66.000.
Muller, Erwin, 4,692,730, Cl. 335-278.000.
Tannhaeuser, Rolf; and Herrmann, Franz, 4,692,920, Cl. 371-27.000.

Siemens Gammasonics, Inc.: *See—*
Arseneau, Roger E., 4,692,890, Cl. 364-733.000.
Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,692,625, Cl. 250-363.00R.

Signtech Inc.: *See—*
Gandy, James, 4,692,847, Cl. 362-152.000.

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Dunn, William J.; and Silver, Brian H., 4,691,557, Cl. 73-32.00A.

Silvernail, James M.; and Miller, Clifford C., to FSI Corporation. Bowl for liquid spray processing machine. 4,691,722, Cl. 134-155.000.

Simanowitz, Solly. Credit card alarm. 4,692,745, Cl. 340-568.000.

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Simonsson, Daniel: *See—*
Bjareklint, Ake; and Simonsson, Daniel, 4,692,229, Cl. 204-151.000.

Simpson, Edwin K., to Harris Press and Shear, Inc. Method for dewatering a mass of wet fibrous material. 4,691,628, Cl. 100-37.000.

Simpson, Scott, to Rogers Corporation. Complex block multipolymer surfactants. 4,692,476, Cl. 521-112.000.

Singery, Denis C.; and Gordon, Ronald O., to Illinois Tool Works Inc. Catheter guide. 4,692,154, Cl. 604-172.000.

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Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, 4,691,535, Cl. 66-144.000.

Sir Henry Lawson-Tancred, Sons & Co. Ltd.: *See—*
Lawson-Tancred, Henry, 4,692,095, Cl. 416-23.000.

SKF Gleitlager GmbH: *See—*
Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, 4,691,422, Cl. 29-149.50B.

SKF Steel Engineering AB: *See—*
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,692,209, Cl. 162-30.100.

Skotnicki, Jerauld S.; and Commons, Thomas J., to American Home Products Corporation. C-3' acylaminooxy-7-[(2-aminothiazol-4-yl)-α-(substituted-oximino)acetyl]cephalosporin derivatives. 4,692,517, Cl. 540-222.000.

Skovgaard, Helge; and Johansen, Kent. Apparatus for recording the speed of a vehicle. 4,692,882, Cl. 364-565.000.

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Aktiengesellschaft. Novel prostacyclin derivatives and a process for the preparation thereof. 4,692,464, Cl. 514-530.000.

SKW Trostberg Aktiengesellschaft: *See*—
Rust, Ulrich, 4,692,415, Cl. 436-20.000.

Slidex Corporation: *See*—
Ozeki, Jiro, 4,691,826, Cl. 206-456.000.

Sliger, Boyd P.; and Wagner, Joseph P., to Robertshaw Controls Company. Valve construction and method of making the same. 4,691,861, Cl. 236-34.500.

Sloan, Alex; and Rennie, Lyall. Liquid recovery unit. 4,691,407, Cl. 15-339.000.

Slusarczyk, Joseph Z.; and Slusarczyk, Nancy L. Container for liquids. 4,691,828, Cl. 206-509.000.

Slusarczyk, Nancy L.: *See*—
Slusarczyk, Joseph Z.; and Slusarczyk, Nancy L., 4,691,828, Cl. 206-509.000.

Smith, Dean L., Jr.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.

Smith, Edward W.: *See*—
Rothbarth, James N.; and Smith, Edward W., 4,692,771, Cl. 343-882.000.

Smith, Gene M. Railroad grade crossing structure. 4,691,863, Cl. 238-8.000.

Smith, Henry D., Jr.; Arterburn, Russell D.; and Miller, John H., to Manville Corporation. Filament gathering apparatus, system and method. 4,692,178, Cl. 65-2.000.

Smith, Iain M., to Aur Hydropower Limited. Water engine. 4,691,514, Cl. 60-503.000.

Smith Kline & French Laboratories Limited: *See*—
Ife, Robert J., 4,692,456, Cl. 514-333.000.

Smith, Michael D.; and Dobat, Daniel F., to Cross Company, The. Tool coupling arrangement for a tooling assembly. 4,692,074, Cl. 409-233.000.

Smith, Otis O. Adjustable dual-wheel caddy. 4,692,082, Cl. 414-429.000.

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Smith, William A.: *See*—
Beining, August H.; and Smith, William A., 4,692,809, Cl. 358-247.000.

Smith, William H.: *See*—
Vinson, Edward F.; and Smith, William H., 4,691,558, Cl. 73-64.100.

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Olson, Daniel H., 4,692,140, Cl. 604-40.000.

Snyder, Teddy R., to OI Forest Products STS Inc. Collapsibie bulk shipping container. 4,691,859, Cl. 229-23.00R.

Soberg, John P.: *See*—
Kirschmann, John D.; and Soberg, John P., 4,691,850, Cl. 222-642.000.

Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., to Institut Fiziki Zemli Imeni O.Ju. Shmidta Akademii Nauk SSSR. Method for geophysical prospecting of complex orebodies. 4,692,905, Cl. 367-14.000.

Societe Alsacienne de Construction de Material Textile: *See*—
Venot, Jean, 4,691,743, Cl. 139-291.00C.

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Brunet, Maurice L.; and Jolivet, Jean-Pierre, 4,692,699, Cl. 324-207.000.

Societe Francaise Hoechst: *See*—
Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, 4,692,226, Cl. 204-73.00R.

Societe Nationale des Poudres et Explosifs: *See*—
Godfrin, Jean-Philippe; Landrevie, Bernard; and Escache, Gerard, 4,691,633, Cl. 102-202.000.

Sokola, Raymond L.: *See*—
Green, Steven R.; De Muro, David M.; and Sokola, Raymond L., 4,692,726, Cl. 333-206.000.

Sokolovsky, Paul J., to Advanced Micro Devices, Inc. Controlled deformation alignment method and apparatus. 4,691,747, Cl. 140-147.000.

Solitec Limited: *See*—
Dunan, Andrew J., 4,691,843, Cl. 222-58.000.

Soma, Takao: *See*—
Matsui, Minoru; and Soma, Takao, 4,692,419, Cl. 501-97.000.
Oda, Isao; and Soma, Takao, 4,692,420, Cl. 501-97.000.

Sommer, Harold Z., to United States of America, Army. Chemical agents. 4,692,530, Cl. 546-261.000.

Son, Pyong-Nae; and Lai, John T., to B. F. Goodrich Company, The. 1,2-ethanediyl-bis-2-piperazinone esters, oligomers thereof, and compositions stabilized thereby. 4,692,487, Cl. 524-100.000.

Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, to Kristal Instrumente AG. Transducer inserts; methods of making them and sensors for measuring mechanical variables. 4,691,575, Cl. 73-756.000.

Sondergeld, Carl H.; Frisillo, Albert L.; and Norris, Janice O., to Amoco Corporation. Methods of determining lithological characteristics of an underground formation which utilize compressional velocity and shear velocity data. 4,692,910, Cl. 367-75.000.

Sonenstein, Gerard G., to Colgate-Palmolive Company. Water soluble films of polyvinyl alcohol and polyacrylic acid and packages comprising same. 4,692,494, Cl. 525-57.000.

Sony Corporation: *See*—
Ito, Yujiro; Kamatsu, Yasutoshi; and Otobe, Takashi, 4,692,721, Cl. 333-109.000.
Suzuki, Katsuhiro, 4,692,831, Cl. 360-133.000.
Tamura, Takahiko; and Sengoku, Yoshinari, 4,692,793, Cl. 358-29.000.

Sony/Tektronix Corporation: *See*—
Miki, Yasuhiko; and Takita, Kentaro, 4,692,886, Cl. 364-718.000.

Souch, Julius. Dopstick transfer jig device and method for using same. 4,691,481, Cl. 51-277.000.

Southern Steel Company: *See*—
Young, Quentin H., 4,691,542, Cl. 70-129.000.

Spector, Donald. Aroma-generating automobile cigarette lighter. 4,692,590, Cl. 219-275.000.

Spector, George: *See*—
Upton, Gain; and Spector, George, 4,692,751, Cl. 340-602.000.
Wainscott, Delores A.; and Spector, George, 4,692,004, Cl. 352-132.000.

Spectronix Ltd.: *See*—
Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.

Spectrum CVD, Inc.: *See*—
Price, J. B.; and Wu, Schyi-Yi, 4,692,343, Cl. 427-38.000.

Spence, Lewis C. Constant frequency signal generator circuit and method. 4,692,715, Cl. 331-2.000.

Spencer, Dennis O.: *See*—
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., 4,692,375, Cl. 428-299.000.

Sperry Corporation: *See*—
Lo, David S.; and Lins, Stanley J., 4,692,899, Cl. 365-29.000.
Rosheim, Mark E., 4,691,973, Cl. 439-161.000.
Wesner, Charles R.; Yancey, John F.; and Coleman, Albert L., 4,692,868, Cl. 364-447.000.

Spinelli, John; Stout, Virginia F.; and Nilsson, William B., to United States of America, Commerce. Purification of fish oils. 4,692,280, Cl. 260-420.000.

Spirk, John W., Jr.; and Nottingham, John R. Hand tool and support. 4,692,587, Cl. 219-242.000.

Spivack, John D.; Ravichandran, Ramanathan; and Pastor, Stephen D., to Ciba-Geigy Corporation. Substituted N-(4-hydroxyphenylthioalkyl) cyclic imides. 4,692,532, Cl. 548-312.000.

Spivack, John D., to Ciba-Geigy Corporation. Pentaerythritol diphosphite stabilizers and process. 4,692,539, Cl. 558-78.000.

SPOFA, spojene podniky pro zdravotnickou vyrobu: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Spotnitz, Robert M.; and Kreh, Robert P., to W. R. Grace & Co. Oxidation of organic compounds using thallium ions. 4,692,227, Cl. 204-78.000.

Sprague Electric Company: *See*—
Bernard, Walter J.; and Florio, Steven M., 4,692,224, Cl. 204-56.100.

Sprague, Richard P.: *See*—
Jacks, Richard P.; and Sprague, Richard P., 4,692,941, Cl. 381-52.000.

Square D Starkstrom GmbH: *See*—
Lemmer, Helmut, 4,691,978, Cl. 439-620.000.

Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telfonie): *See*—
van Leijenhorst, Harro M.; and Suringh, Jan F., 4,691,586, Cl. 74-479.000.

Stabilus GmbH: *See*—
Lauderbach, Leo, 4,692,057, Cl. 403-334.000.

Stacchino, Giuseppe: *See*—
Sburlati, Luigi; Acuto, Giovanni; and Stacchino, Giuseppe, 4,691,946, Cl. 248-429.000.

Staerzl, Richard E., to Brunswick Corporation. Starting-enrichment control for a fuel-injected engine. 4,691,680, Cl. 123-491.000.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Open-end friction spinning machine. 4,691,509, Cl. 57-264.000.

Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,691,509, Cl. 57-264.000.

Stamicarbon B.V.: *See*—
Bongers, Jozef J. M.; and Van Geenen, Albert A., 4,692,521, Cl. 540-451.000.

Stamicarbon B.V. (Subsidiary of DSM): *See*—
Van Geenen, Albert A.; and Bongers, Jozef J. M., 4,692,520, Cl. 540-451.000.

Stamm, Nikolaus, to A. Konrad Feinmechanik AG. Process and machine for hooping a package with a hooping band. 4,691,498, Cl. 53-399.000.

Standard Oil Company, The: *See*—
Bodolus, Christopher L.; and Woodhead, David A., 4,692,498, Cl. 525-285.000.
Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., 4,692,502, Cl. 526-193.000.

Standard Telephones and Cables Public Limited Company: *See*—
Baines, Peter J., 4,692,940, Cl. 379-424.000.
Extance, Philip; Jones, Roger E.; and Martin, Stewart O., 4,692,703, Cl. 324-251.000.

Stanley, Jack E.: *See*—
Parker, Wesley A.; Hardesty, Donald E.; and Stanley, Jack E., 4,692,235, Cl. 208-113.000.

Stannard, Forrest B.; and Highstreet, Edward J., to Dehydro Corporation, The. Drum filter with resin bound particulate filter media. 4,692,248, Cl. 210-403.000.

Stanojevic, Silvo, to National Semiconductor Corporation. Zero standby current switch method and apparatus. 4,692,688, Cl. 323-285.000.

Stansbury, Benjamin H., Jr.; and Henderson, Richard E. Hot water heater knob adaptor. 4,692,051, Cl. 403-3.000.

Stauffer Chemical Company: *See—*
Carter, Charles G., 4,692,545, Cl. 560-18.000.
Goswami, Jagadish C.; and Aurichio, Joseph A., 4,692,272, Cl. 252-514.000.
Gray, Reed A.; and Joo, Grant K., 4,692,186, Cl. 71-100.000.
Michaely, William J., 4,692,185, Cl. 71-94.000.

Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., to Celanese Corporation. Process for devolatilizing molten oxymethylene polymer. 4,692,290, Cl. 264-101.000.

Steele, Robert, to Ampex Corporation. Method and apparatus for controlling the position of a transported web. 4,692,819, Cl. 360-72.100.

Stefaniak, Philip S.: *See—*
Fromm, George R.; and Stefaniak, Philip S., 4,692,586, Cl. 219-225.000.

Stegemann, Joachim: *See—*
Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,692,218, Cl. 203-19.000.

Steiger, Horea. Step-like flower-box support structure. 4,691,832, Cl. 211-71.000.

Stellaccio, Robert J.; and Suggitt, Robert M., to Texaco Inc. Coal gasification process. 4,692,172, Cl. 48-197.00R.

STEMCOR Corporation: *See—*
Boecker, Wolfgang D. G.; and Reini, George L., 4,692,418, Cl. 501-90.000.

Stenzel, Gerhard; and Kaule, Wittich, to GAO Gesellschaft fur Automation und Organisation mbH. Printed security with hallmarks. 4,691,940, Cl. 283-70.000.

Stepan Company: *See—*
Nussbaum, Marvin, 4,692,279, Cl. 260-402.000.

Stephenson, Brian D.: *See—*
Marzili, Joseph C.; and Stephenson, Brian D., 4,691,977, Cl. 439-404.000.

Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, to Spectronix Ltd. Automatic modular fire extinguisher system for computer rooms. 4,691,783, Cl. 169-61.000.

Sternglass, Ernest J.: *See—*
Sashin, Donald; and Sternglass, Ernest J., 4,692,937, Cl. 378-062.000.

Stetson, Catherine C.: *See—*
Stetson, Charles G.; and Stetson, Catherine C., 4,692,339, Cl. 426-72.000.

Stetson, Charles G.; and Stetson, Catherine C. Process for addition and stabilization of vitamin C in a hard candy-like comestible. 4,692,339, Cl. 426-72.000.

Stewart, David A.: *See—*
Auel, RaeAnn M.; Jolson, Joseph D.; and Stewart, David A., 4,692,220, Cl. 204-1.00T.

Stewart, Elizabeth C.: *See—*
Brown, Robert L.; and Stewart, Elizabeth C., 4,692,262, Cl. 252-106.000.

Stichting Katholieke Universiteit: *See—*
Tesser, Godefridus I.; and Claesen, Christianus A. A., 4,692,542, Cl. 558-184.000.

Stiegler, Harvey J., to Texas Instruments Incorporated. CMOS/NMOS decoder and high-level driver circuit. 4,692,638, Cl. 307-449.000.

Stierman, Roger J.: *See—*
Haefling, James F.; Pritchard, James W.; and Stierman, Roger J., 4,691,854, Cl. 228-4.500.

Stikvoort, Eduard F.; van Roermund, Arthur H. M.; and Naus, Peter J. A., to U.S. Philips Corporation. Encoding device. 4,692,737, Cl. 340-347.0DD.

Stiles, Frank B. Catheter for effecting removal of obstructions from a biological duct. 4,692,139, Cl. 604-22.000.

Stine, Clifford R., to Radiation Dynamics, Inc. Methods for impact and vibration damping and articles therefor. 4,691,782, Cl. 168-12.000.

Stoffel, Karl-Heinz: *See—*
Welz, Martin; Czauderna, Bernhard; and Stoffel, Karl-Heinz, 4,692,373, Cl. 428-285.000.

Stone, Walter H.: *See—*
Church, John F.; and Stone, Walter H., 4,692,245, Cl. 210-232.000.

Stora Kopparbergs Bergslags AB: *See—*
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,692,209, Cl. 162-30.100.

Storace, Anthony, to Technalytics, Inc. Surgical stapler. 4,691,853, Cl. 227-19.000.

Stottlemyer, Quayton R.: *See—*
LeRoux, Donald F.; and Stottlemyer, Quayton R., 4,692,083, Cl. 414-411.000.

Stout, Virginia F.: *See—*
Spinelli, John; Stout, Virginia F.; and Nilsson, William B., 4,692,280, Cl. 260-420.000.

Strakova, Jana: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Stratus Corporation: *See—*
Scherer, Richard M., 4,691,666, Cl. 122-33.000.

Strausak AG: *See—*
Schleuniger, Kurt; and Hermann, Peter, 4,691,576, Cl. 73-821.000.

Strauss, Herbert. Wheelchair parking brake. 4,691,933, Cl. 280-289.0WC.

Strauss, Paul: *See—*
Adler, Robert; and Strauss, Paul, 4,692,660, Cl. 313-477.00R.

Strebkov, Dmitry S.: *See—*
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

Street, Graham S. B., to Brightad Limited. Method and apparatus for producing stereoscopic images. 4,692,792, Cl. 358-3.000.

Streinz, Wolfgang: *See—*
Ehrlenspiel, Klaus; John, Thomas; and Streinz, Wolfgang, 4,692,126, Cl. 464-103.000.

Streitmatter, Ronald W.: *See—*
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Strom, Johan P.: *See—*
Larsson, Klas G. I.; Lindholm, Rolf C.; and Strom, Johan P., 4,691,616, Cl. 89-41.070.

Strom-Tec, Inc.: *See—*
Arensdorf, Stephen C.; Stromgren, Lawrence T.; and Goudreau, Noel, 4,691,697, Cl. 128-80.00L.

Stromgren, Lawrence T.: *See—*
Arensdorf, Stephen C.; Stromgren, Lawrence T.; and Goudreau, Noel, 4,691,697, Cl. 128-80.00L.

Stromswold, David C.: *See—*
Allen, Linus S.; Mills, William R., Jr.; and Stromswold, David C., 4,692,617, Cl. 250-270.000.

Strong, Michael P., to J. B. Golf Enterprises, Inc. Golfer's arm movement control device. 4,691,924, Cl. 273-189.00R.

Stuchlik, Josef: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Studer, Robert L.; and Schourup, William E. Method and apparatus for valve assembly for a hot water tank. 4,691,726, Cl. 137-15.000.

Studt, William L.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,692,445, Cl. 514-212.000.

Sud-Chemie Aktiengesellschaft: *See—*
Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., 4,692,425, Cl. 502-81.000.

Sudol, Walter J.; and Habich, Michael P., to A. W. Chesterton Company. Temperature-compensating mechanical face seal. 4,691,927, Cl. 277-26.000.

Sueta, Yosh[i]hisa, to International Business Machines Corporation. Test system for keyboard interface circuit. 4,692,691, Cl. 324-73.00R.

Sugai, Hiroo: *See—*
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.

Suggitt, Robert M.: *See—*
Stellaccio, Robert J.; and Suggitt, Robert M., 4,692,172, Cl. 48-197.00R.

Sugimoto, Kenichi: *See—*
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.

Sugimoto, Yasuhiro: *See—*
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.

Sugisawa, Kunio: *See—*
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.

Sugita, Michiyuki: *See—*
Takahashi, Katsuhiko; and Sugita, Michiyuki, 4,692,480, Cl. 523-218.000.

Sugiura, Masahiro: *See—*
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Sugiura, Saburo: *See—*
Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, 4,691,899, Cl. 266-140.000.

Sugiura, Sadanobu: *See—*
Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, 4,691,844, Cl. 222-591.000.

Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, to Victor Company of Japan Ltd. Digital data transmitting system for transmitting digital data a number of times depending on an information content of the digital data. 4,692,816, Cl. 358-342.000.

Sugiyama, Susumo: *See—*
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.

Sugo, Yasuhisa: *See—*
Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, 4,692,900, Cl. 365-63.000.

Sulmone, Michael: *See—*
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Sulzbach, Reinhard A.; and von Werner, Konrad, to Hoechst Aktiengesellschaft. Stable, aqueous, colloidal dispersions of copolymers of the tetrafluorethylene/ethylene type and a process for their preparation. 4,692,493, Cl. 524-805.000.

Sulzer Brothers Limited: *See—*
Tauscher, Willy; and Schneider, Gottlieb, 4,692,030, Cl. 366-337.000.

Sumitomo Metal Mining Company Limited: *See—*
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Hayata, Naohiro, 4,691,431, Cl. 29-526.00R.

Sumner, Terence E.: *See—*
Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., 4,692,571, Cl. 200-5.00A.

Sun Refining and Marketing Company: *See—*
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,692,426, Cl. 502-154.000.

Sundstrand Corporation: *See—*
Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,692,671, Cl. 318-11.000.

Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, to Henkel Kommanditgesellschaft auf Aktien. Dishwashing compositions comprising an enzyme and a C_8–C_{10} alkanol with 0–2 moles of propylene oxide. 4,692,260, Cl. 252-99.000.

Supp, Armin; and Nebe, Rainer, to Krupp Polysius AG. Disperser for a flotation system. 4,692,244, Cl. 210-219.000.

Suringh, Jan F.: *See—*
van Leijenhorst, Harro M.; and Suringh, Jan F., 4,691,586, Cl. 74-479.000.

Sussman, Howard. Container for a plastic trash bag or the like. 4,691,841, Cl. 220-404.000.

Sutoh, Junichi: *See—*
Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Sutoh, Junichi, 4,692,422, Cl. 501-136.000.

Sutton, Bernard. Versatile fitness kit. 4,691,915, Cl. 272-68.000.

Suwa, Masateru: *See—*
Nihei, Masayasu; Suwa, Masateru; and Chigasaki, Mitsuo, 4,692,230, Cl. 204-192.310.

Suzuki, Akira: *See—*
Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.

Suzuki, Katsuhiro, to Sony Corporation. Disc cartridge having positive isolation means when in storage. 4,692,831, Cl. 360-133.000.

Suzuki, Kazufumi: *See—*
Unno, Shohei; Nakakawazi, Mikio; and Suzuki, Kazufumi, 4,692,760, Cl. 340-756.000.

Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, to Takeda Riken Co., Ltd. IC test equipment. 4,691,831, Cl. 209-573.000.

Suzuki, Kenji, to Fuji Photo Film Co., Ltd. Color image sensor with picture elements each comprising an M×N matrix of red, green, and blue photoelectric conversion elements featuring controllable charge storage time and selective readout for each color. 4,692,794, Cl. 358-44.000.

Suzuki, Seigo; Yabe, Yukihiko; and Kawakami, Masumi, to Kabushiki Kaisha Toshiba. Majority circuit comprising binary counter. 4,692,640, Cl. 307-464.000.

Suzuki, Seigo, to Kabushiki Kaisha Toshiba. Analog signal processing apparatus. 4,692,738, Cl. 340-347.00C.

Suzuki, Takashi, to Sharp Kabushiki Kaisha. Electronic clinical thermometer. 4,691,713, Cl. 128-736.000.

Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Molding material and mold. 4,691,756, Cl. 164-361.000.

Suzuki, Tetsuo: *See—*
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,692,778, Cl. 346-145.000.

Suzuki, Yoshio; Yamamoto, Mitsuoki; and Hosomi, Hisashi, to Takenaka Komuten Co., Ltd. Offshore unit structure. 4,692,065, Cl. 405-211.000.

Suzuki, Yoshio, to Toshiba Kikai Kabushiki Kaisha. Electrostatic chucks. 4,692,836, Cl. 361-234.000.

Swanson, Roy T., to S&C Electric Company. Switch for a high-voltage interrupting module. 4,692,577, Cl. 200-151.000.

Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., to S&C Electric Company. Interrupting device with improved current-limiting arrangement. 4,692,734, Cl. 337-162.000.

Swanson, Steve E.: *See—*
Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., 4,691,985, Cl. 350-96.180.

Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., to International Paper Company. Kraft linerboard by densification and heat treatment. 4,692,212, Cl. 162-206.000.

SWF Electric GmbH: *See—*
Bauer, Kurt; and Schneider, Theodor, 4,692,677, Cl. 318-443.000.

Szuchy, Nicholas C., to Grumman Aerospace Corporation. Fiber optic aircraft load relief control system. 4,692,610, Cl. 250-227.000.

Tabata, Kuniaki: *See—*
Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,692,757, Cl. 340-721.000.

Tachi, Hiroyuki: *See—*
Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.

Tachibana, Hirokazu: *See—*
Sekido, Satoshi; Tachibana, Hirokazu; and Yamamura, Yasuharu, 4,692,429, Cl. 502-303.000.

Tachibna, Natsuki; and Ichihara, Issey, to Kabushiki Kaisha Toshiba. Developing device. 4,691,663, Cl. 118-658.000.

Tachikawa Spring Co. Ltd.: *See—*
Mikuniya, Kunio; and Kojima, Akira, 4,691,963, Cl. 297-195.000.

Tada, Atsushi. Manually operated trigger type dispenser. 4,691,849, Cl. 222-382.000.

Tada, Naofumi: *See—*
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.

Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, to Honda Giken Kogyo Kabushiki Kaisha. Outboard motor. 4,692,123, Cl. 440-77.000.

Taga, Yutaka; and Morisawa, Kunio, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control system for automatic transmission. 4,691,594, Cl. 74-869.000.

Taig, Alistair G., to Allied Corporation. Self-adjusting rack support. 4,691,583, Cl. 74-422.000.

Takada, Yasuo: *See—*
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Takagi, Kazumasa: *See—*
Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, 4,691,983, Cl. 350-96.120.

Takahara, Masayuki; and Momoki, Motoyasu, to Olympus Optical Co., Ltd. Magnetic recording/reproducing apparatus. 4,692,824, Cl. 360-85.000.

Takahashi, Katsuhiko; and Sugita, Michiyuki, to Polyplastics Co., Ltd. Thermoplastic resin composition. 4,692,480, Cl. 523-218.000.

Takahashi, Kenichi, to Hitachi, Ltd. System and method for automatic transaction. 4,692,600, Cl. 235-379.000.

Takahashi, Nobuaki: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.

Takahashi, Toru; and Yoshida, Taro, to Fujimori Kogyo Co., Inc. Laminated film for packaging. 4,692,327, Cl. 428-35.000.

Takai, Kiyoshi; and Iwasaki, Kiyoshi, to Godo Steel, Ltd. System using electric furnace exhaust gas to preheat scrap for steelmaking. 4,692,113, Cl. 432-72.000.

Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, to Ohi Seisakusho Co., Ltd. Actuator for remote devices or the like. 4,691,584, Cl. 74-471.00R.

Takami, Satoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Digital data output from a camera. 4,692,005, Cl. 354-21.000.

Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, to Tokyo Juki Industrial Co., Ltd. Input device for sewing machine. 4,691,649, Cl. 112-121.120.

Takano, Kunio: *See—*
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.

Takasu, Noboru: *See—*
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,691,872, Cl. 242-4.00R.

Takayama, Syuichi, to Olympus Optical Co. Calculus disintegrating apparatus. 4,691,706, Cl. 128-328.000.

Takeda Chemical Industries, Ltd.: *See—*
Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, 4,692,519, Cl. 540-227.000.

Takeda Riken Co., Ltd.: *See—*
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.

Takei, Masahiro: *See—*
Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, 4,692,914, Cl. 369-49.000.

Takei, Toshihiro: *See—*
Matsuda, Takeshi; Miyamoto, Masaii; and Takei, Toshihiro, 4,692,092, Cl. 415-143.000.

Takekawa, Yujiro; and Matsuda, Fumio, to Tsudakoma Kogyo Kabushiki Kaisha. Multi-nozzle weft insertion device for a fluidic jet shuttleless-loom. 4,691,745, Cl. 139-435.000.

Takemae, Yoshihiro, to Fujitsu Limited. FET voltage reference circuit with threshold voltage compensation. 4,692,689, Cl. 323-313.000.

Takemura, Makoto: *See—*
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,692,778, Cl. 346-145.000.

Takenaka Komuten Co., Ltd.: *See—*
Suzuki, Yoshio; Yamamoto, Mitsuoki; and Hosomi, Hisashi, 4,692,065, Cl. 405-211.000.

Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, to Kabushiki Kaisha Toshiba. Color cathode ray tube having shadow mask with silicon. 4,692,659, Cl. 313-402.000.

Takeshima, Tohru: *See—*
Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, 4,692,900, Cl. 365-63.000.

Takeuchi, Hiroshi: *See—*
Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,653, Cl. 310-334.000.
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.

Takeuchi, Kobuo: *See—*
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.

Takiguchi, Haruhisa: *See*—
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,692,206, Cl. 156-649.000.

Takita, Kentaro: *See*—
Miki, Yasuhiko; and Takita, Kentaro, 4,692,886, Cl. 364-718.000.

Takizawa, Satoshi, to Nissan Motor Co., Ltd. Apparatus for controlling lock-up clutch of lock-up type automatic transmission of automobile. 4,691,812, Cl. 192-3.300.

Tamai, Motomi: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Tamfelt Oy Ab: *See*—
Juutilainen, Holger, 4,692,059, Cl. 405-63.000.

Tamoni, Giorgio: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.

Tamura, Hiroshi: *See*—
Wakino, Kikuo; Tamura, Hiroshi; and Ishikawa, Youhei, 4,692,727, Cl. 333-219.000.

Tamura, Kazuyuki: *See*—
Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, 4,692,613, Cl. 250-231.0SE.

Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, to Nissan Motor Co., Ltd. Machine for holding workpiece. 4,691,905, Cl. 269-45.000.

Tamura, Takahiko; and Sengoku, Yoshinari, to Sony Corporation. Circuit for blanking the video of a television set for a time after turn-on. 4,692,793, Cl. 358-29.000.

Tamura, Takashi, to Konishiroku Photo Industry Co., Ltd. Cartridge-type apparatus for exchanging a developing device and toner supply container. 4,692,018, Cl. 355-3.00R.

Tanabe Seiyaku Co., Ltd.: *See*—
Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, 4,692,409, Cl. 435-109.000.

Tanabe, Yoshimitsu: *See*—
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.

Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Refrigeration Company. Heat exchanger. 4,691,767, Cl. 165-151.000.

Tanaka, Kunio: *See*—
Kishi, Hajimu; and Tanaka, Kunio, 4,692,873, Cl. 364-474.000.

Tanaka, Sinya: *See*—
Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, 4,692,924, Cl. 372-30.000.

Tanaka, Sumio; Saito, Shinji; and Atsumi, Shigeru, to Kabushiki Kaisha Toshiba. Semiconductor read only memory device with improved access time. 4,692,902, Cl. 365-210.000.

Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, to Sharp Kabushiki Kaisha. Semiconductor color sensor detection circuit. 4,692,025, Cl. 356-45.000.

Taniguchi, Harutaka; and Fumoto, Takafumi, to Fuji Electric Co., Ltd.; and Fuji Electric Corporate Research and Development Ltd. Infrared analyzer. 4,692,622, Cl. 250-343.000.

Taniguchi, Masato: *See*—
Kojima, Takio; and Taniguchi, Masato, 4,691,673, Cl. 123-271.000.

Taniguchi, Tomoyasu: *See*—
Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, 4,692,409, Cl. 435-109.000.

Tanne, Emanuel. Automatic corneal surgery system. 4,691,715, Cl. 128-774.000.

Tanne, Emanuel. Automatic corneal surgery system. 4,691,716, Cl. 128-774.000.

Tannhaeuser, Rolf; and Herrmann, Franz, to Siemens Aktiengesellschaft. Apparatus for generating patterns of test signals. 4,692,920, Cl. 371-27.000.

Tanno, Satoshi: *See*—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, to Kowa Company Ltd. Automatic focus adjustment apparatus. 4,692,012, Cl. 354-403.000.

Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, to Toyota Jidosha Kabushiki Kaisha. Control apparatus for power-assisted steering system. 4,691,796, Cl. 180-142.000.

Tarman, Paul B.: *See*—
Bodle, William W.; and Tarman, Paul B., 4,692,238, Cl. 208-407.000.

Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., to John O. Butler Company. Toothbrush. 4,691,404, Cl. 15-167.00R.

Tashiro, Yasunori: *See*—
Hayashi, Torahiko; and Tashiro, Yasunori, 4,692,109, Cl. 425-308.000.

Tasson, Brian B.: *See*—
Meyer, David A.; Tasson, Brian B.; Vollmer, Robert F.; and Warren, J. Bruce, 4,691,638, Cl. 102-434.000.

Tatar, Fred W.: *See*—
Dundas, Robert E.; and Tatar, Fred W., 4,692,701, Cl. 324-240.000.

Tatsuda, Kazunori: *See*—
Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, 4,692,663, Cl. 313-495.000.

Tauscher, Willy; and Schneider, Gottlieb, to Sulzer Brothers Limited. Static mixing device for viscous melts. 4,692,030, Cl. 366-337.000.

Taylor, Jack D.; and Collier, L. Warren, IV, to Kimberly-Clark Corporation. Elastic spunlaced polyester-meltblown polyetherurethane laminate. 4,692,368, Cl. 428-137.000.

Taylor, Peter J.; Clarke, Alan; and Thompson, John S., to Plessey Overseas Ltd. Fuel supply systems. 4,691,510, Cl. 60-39.094.

TDK Corporation: *See*—
Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Sutoh, Junichi, 4,692,422, Cl. 501-136.000.
Ota, Hiroshi, 4,692,377, Cl. 428-323.000.

Teac Corporation: *See*—
Noda, Yasushi; and Kitahara, Toshihiro, 4,692,828, Cl. 360-97.000.

Technalytics, Inc.: *See*—
Storace, Anthony, 4,691,853, Cl. 227-19.000.

Technitrol, Inc.: *See*—
Cargill, N. Allen; and Malashkin, Michail, 4,691,910, Cl. 271-3.000.

Tecumseh Products Company: *See*—
Geringer, Miles S.; and Kaufman, Vernan R., 4,691,590, Cl. 74-579.00E.

Tedder, Daniel W., to Georgia Tech Research Corporation. Two cycle process for producing fuel-grade ethanol from dilute aqueous mixtures. 4,692,432, Cl. 568-916.000.

Tekna Recherche & Developpment Inc.: *See*—
Tremblay, Paul; and Tzabanakis, Georges, 4,691,988, Cl. 350-96.230.

Tektronix, Inc.: *See*—
Quinn, Patrick A., 4,692,712, Cl. 330-261.000.

Telectronics N.V.: *See*—
Whigham, Robert H., 4,692,719, Cl. 332-11.00D.

Teledyne Canada Limited: *See*—
Parsons, Michael, 4,692,085, Cl. 414-633.000.

Teledyne Industries, Inc.: *See*—
Kadis, Paul M., 4,691,902, Cl. 267-119.000.

Telefonaktiebolaget LM Ericsson: *See*—
Andersen, Ib N., 4,692,860, Cl. 364-200.000.

Tenma, Tadashi; Akashi, Kichizo; Konishi, Yozo; and Watase, Hideo, to Hitachi, Ltd. Automatic freight stacking system. 4,692,876, Cl. 364-513.000.

Tenneco Canada Inc. (ERCO division): *See*—
Twardowski, Zbigniew, 4,692,228, Cl. 204-105.00R.

Tenud, Leander; and Gosteli, Jacques, to Lonza Ltd. Optically-active di-[3-chloro-2-oxy-propyltrimethylammonium]-tartrate. 4,692,543, Cl. 558-342.000.

Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., to John Lysaght (Australia) Limited. Rolling mill strip thickness controller. 4,691,547, Cl. 72-16.000.

Terada, Motoharu: *See*—
Murakami, Kazumasa; and Terada, Motoharu, 4,692,750, Cl. 340-588.000.

Teramachi, Hiroshi. Recirculating-ball linear bearing and guide rail therefor. 4,692,039, Cl. 384-45.000.

Terasawa, Masaaki: *See*—
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.

Ternstrom, Maj I.: *See*—
Widlund, Leif U. R.; and Ternstrom, Maj I., 4,692,163, Cl. 604-385.00A.

Teske, Richard E.: *See*—
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Teskin, Frederick M.: *See*—
Ficker, Harold K.; and Teskin, Frederick M., 4,692,489, Cl. 524-243.000.

Tesser, Godefridus I.; and Claesen, Christianus A. A., to Stichting Katholieke Universiteit. Phosphorylating agent. 4,692,542, Cl. 558-184.000.

Tessier, James R.: *See*—
Roucek, Joseph A.; and Tessier, James R., 4,691,426, Cl. 29-402.180.

Tetenbaum, Marvin T.: *See*—
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; and Tetenbaum, Marvin T., 4,692,383, Cl. 428-414.000.

Texaco Inc: *See*—
Mazzagatti, Roy P.; and Dowling, Donald J., 4,692,706, Cl. 324-338.000.

Texaco Inc.: *See*—
Friedman, Robert H., 4,692,239, Cl. 208-430.000.
Stellaccio, Robert J.; and Suggitt, Robert M., 4,692,172, Cl. 48-197.00R.

Texas A&M University System, The: *See*—
Lindner, Luther E.; and Wechter, Stephen R., 4,692,403, Cl. 435-5.000.

Texas Instruments Incorporated: *See*—
Bayraktaroglu, Burhan, 4,692,791, Cl. 357-81.000.
Haefling, James F.; Pritchard, James W.; and Stierman, Roger J., 4,691,854, Cl. 228-4.500.
Possley, Glen G.; and Wilson, Earl C., 4,692,787, Cl. 357-59.000.

Rountree, Robert N.; and Herndon, Troy H., 4,692,781, Cl. 357-23.130.
Stiegler, Harvey J., 4,692,638, Cl. 307-449.000.
Wendling, Robert W.; Kurtz, John W.; and Perez, Juan M., 4,691,886, Cl. 248-183.000.

TH. Goldschmidt AG: *See*—
Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, 4,692,267, Cl. 252-321.000.
Kollmeier, Hans-Joachim; and Lammerting, Helmut, 4,692,292, Cl. 264-126.000.

Thaniyavarn, Suwat, to TRW Inc. Wavelength-independent polarization converter. 4,691,984, Cl. 350-96.140.

Theeuwes, Felix: *See*—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,692,326, Cl. 424-15.000.

Theis, Peter F., to Morgan Industries, Inc. Programmed conversation recording system. 4,692,817, Cl. 360-12.000.

Theissen, Mario: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Theodoulou, Sotos M.: *See*—
Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, 4,692,017, Cl. 355-3.0DD.

Thermco Systems, Inc.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Thermo Electron-Web Systems, Inc.: *See*—
Goodnow, Ronald F.; and Reid, Robert A., 4,691,406, Cl. 15-256.530.

Theuer, Rudolf: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machine for measuring track parameters. 4,691,565, Cl. 73-146.000.

Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., to UNIPAT AG. Rotary hydrostatic machines or transmissions. 4,691,512, Cl. 60-456.000.

Thomas, Charles E. Low-distortion line voltage regulator. 4,692,686, Cl. 323-263.000.

Thompson, John S.: *See*—
Taylor, Peter J.; Clarke, Alan; and Thompson, John S., 4,691,510, Cl. 60-39.094.

Thomson CSF: *See*—
Becavin, Henri G., 4,692,768, Cl. 342-368.000.
de Sartre, Jean; and Maige, Philippe, 4,692,853, Cl. 363-49.000.
Morgand, Jean P., 4,692,942, Cl. 381-114.000.

Thomson Video Equipement: *See*—
Phan Van Cang, Luc, 4,692,759, Cl. 340-748.000.

Tifre, Salustiano. Space skating shoe. 4,691,453, Cl. 36-8.300.

Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, to SKF Gleitlager GmbH. Method and apparatus for making ball and socket joints incorporating a slip liner. 4,691,422, Cl. 29-149.50B.

Timmons, Robert D. Process for making a molded porous fluoroplastic resin material. 4,692,287, Cl. 264-41.000.

Titus, John D.; and Hall, Phillip E., to Motorola, Inc. Electro-explosive safety and arming device. 4,691,634, Cl. 102-245.000.

Tlucko, Jozef: *See*—
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

TMC Corporation: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

Tobita, Katsumi, to Alps Electric Co., Ltd. CATV converter having phase locked loop for sound carrier wave frequency control. 4,692,803, Cl. 358-143.000.

Tofanetti, Odoardo: *See*—
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Tognella, Sergio: *See*—
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Tokita, Minoru: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Tokunaga, Hiroshi: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.

Tokunaga, Kunishige: *See*—
Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, 4,691,844, Cl. 222-591.000.

Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, to Hitachi, Ltd. Semiconductor switching device having plural MOSFET's, GTO's or the like connected in series. 4,692,643, Cl. 307-584.000.

Tokura, Go: *See*—
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.

Tokyo Electric Co., Ltd.: *See*—
Hujita, Yutaka, 4,692,679, Cl. 318-696.000.
Unno, Shohei; Nakakawazi, Mikio; and Suzuki, Kazufumi, 4,692,760, Cl. 340-756.000.

Tokyo Gas Co., Ltd.: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.
Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.

Tokyo Kagaku Kakai Kabushiki Kaisha: *See*—
Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, 4,692,924, Cl. 372-30.000.

Tokyo Kagaku Kikai Kabushiki Kaisha: *See*—
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.

Tokyo Keiki Company, Ltd.: *See*—
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Naka, Shigekatsu, 4,692,090, Cl. 415-112.000.
Wada, Masashi, 4,692,785, Cl. 357-52.000.

Tolpin, Thomas W.; and Kretchmer, Richard A., to Amoco Corporation. Process for simultaneously removing nitrogen oxides, sulfur oxides, and particulates. 4,692,318, Cl. 423-239.000.

Tomaki, Kenji: *See*—
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.

Tomashauser, Josef: *See*—
Zodrow, Rudolf; and Tomashauser, Josef, 4,692,201, Cl. 156-488.000.

Tomcanin, William J.: *See*—
Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.

Tomita, Koji: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.

Tomma, Kauko, to Oy Wartsila AB. Method for producing a concrete-filled steel body for suppressing vibrations. 4,691,488, Cl. 52-223.00R.

Tomse, Jack. Towing system for vehicles. 4,691,934, Cl. 280-503.000.

Tomy Kogyo Co., Inc.: *See*—
Iseki, Takeo, 4,691,921, Cl. 273-85.00B.

Tongu, Shinji, to Yazaki Corporation. Air-cooled absorption type water cooling/heating apparatus. 4,691,528, Cl. 62-238.300.

Topness, Paul C.: *See*—
Ganz, Ulrich W.; and Topness, Paul C., 4,691,561, Cl. 73-117.100.

Torgerson, Gary D.; and Ferm, Joyce E., to Ferm & Torgerson Partnership. Hinge mask. 4,691,409, Cl. 16-250.000.

Torley, Lawrence W.: *See*—
Medwid, Jeffrey B.; and Torley, Lawrence W., 4,692,449, Cl. 514-254.000.

Tornay, Edmund, to Energy Transportation Group Inc. Tug/barge apparatus. 4,691,660, Cl. 114-248.000.

Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., to General Electric Company. Unique epoxy resin compositions and composite molded bodies filled therewith. 4,692,499, Cl. 525-524.000.

Torrington Company, The: *See*—
Ebaugh, Roger L.; and Rhodes, Jerry P., 4,692,040, Cl. 384-484.000.

Tosbac Computer System Co., Ltd.: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.

Toshiba Ceramics Co., Ltd.: *See*—
Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, 4,691,844, Cl. 222-591.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Suzuki, Yoshio, 4,692,836, Cl. 361-234.000.

Toshimitsu, Hiroyuki: *See*—
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.

Toth, Kalman: *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Town Talk, Inc.: *See*—
Meyer, Eugene F., 4,691,389, Cl. 2-195.000.

Toyo Chemical Co., Ltd.: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, 4,692,132, Cl. 493-103.000.
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Toyoda, Yasuhiro; Shimada, Fumio; and Yoshida, Katsumi, to Canon Kabushiki Kaisha. Braking device for shutter. 4,692,009, Cl. 354-246.000.

Toyoda, Yukio: *See*—
Watanabe, Yoji; Morimura, Toshio; and Toyoda, Yukio, 4,692,313, Cl. 422-241.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.
Hyodo, Youichi, 4,691,932, Cl. 280-91.000.

Miyadera, Kazuhiko, 4,691,960, Cl. 296-37.800.
Taga, Yutaka; and Morisawa, Kunio, 4,691,594, Cl. 74-869.000.
Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, 4,691,796, Cl. 180-142.000.
Yao, Hiroyuki; and Okamoto, Yuji, 4,691,476, Cl. 49-374.000.

Toyota, Makoto: *See—*
Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, 4,692,608, Cl. 250-216.000.

Trautmann, Walter: *See—*
Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, 4,692,527, Cl. 544-405.000.

Travale, Samuel: *See—*
Shepherd, Charles G.; and Travale, Samuel, 4,691,689, Cl. 126-295.000.

Trayco, Inc.: *See—*
Whitney, Thomas H., 4,691,392, Cl. 4-595.000.

Trchnische (Rijks) Hogeschool: *See—*
van der Vegt, Anne K., 4,692,495, Cl. 525-184.000.

Trebor Industries, Inc.: *See—*
Rosenthal, Robert D., 4,692,620, Cl. 250-343.000.

Tremblay, Paul; and Tzabanakis, Georges, to Tekna Recherche & Developpment Inc. Pulling eye assembly. 4,691,988, Cl. 350-96.230.

Trequilly, Yves: *See—*
Andrieux, Alain; Trequilly, Yves; and Lavoine, Jean-Claude, 4,692,841, Cl. 361-395.000.

Tressl, Guenther: *See—*
Conrad, Bernhard; and Tressl, Guenther, 4,692,813, Cl. 358-294.000.

Tribometrics, Inc.: *See—*
Lewis, Robert T., 4,692,698, Cl. 324-204.000.

Trillian Computer Corporation: *See—*
Redford, Peter M.; and Redford, Rita A., 4,692,858, Cl. 364-200.000.

Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., to Motorola, Inc. Panel assembly with easily detachable switch actuators. 4,692,571, Cl. 200-5.00A.

Troutner, Vernon H.; and King, Martin J., to McNeilab, Inc. Pump block for interfacing irradiation chamber to photoactivation patient treatment system. 4,692,138, Cl. 604-4.000.

Trubiano, Antoine, to Cari-All Inc. Locking device for interlocking nested shopping carts. 4,691,816, Cl. 194-212.000.

Trumbauer, David V.; Fosbinder, Larry L.; and Erion, Terry L., to Deere & Company. Method for forming castings having inserts. 4,691,754, Cl. 164-9.000.

Trutzschler GmbH & Co. KG: *See—*
Kluttermann, Jurgen; and Trutzschler, Hermann, 4,691,413, Cl. 19-159.00R.
Kluttermann, Jurgen, 4,691,414, Cl. 19-159.00R.

Trutzschler, Hermann: *See—*
Kluttermann, Jurgen; and Trutzschler, Hermann, 4,691,413, Cl. 19-159.00R.

TRW Automotive Products Inc.: *See—*
Higbee, Wallace C., 4,691,875, Cl. 242-107.40B.

TRW Inc.: *See—*
Friedman, Gerald, 4,691,857, Cl. 228-265.000.
Miller, Laurence L., 4,691,797, Cl. 180-143.000.
Thaniyavarn, Suwat, 4,691,984, Cl. 350-96.140.

Tsubakimoto Chain Co.: *See—*
Murai, Masasumi, 4,691,640, Cl. 104-140.000.
Yokoi, Satoru; and Kondo, Hirokazu, 4,692,694, Cl. 324-158.00F.

Tsuboi, Shinichi: *See—*
Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, 4,692,436, Cl. 514-129.000.

Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, to Matsushita Electric Industrial Co., Ltd. Apparatus for processing image signal. 4,692,811, Cl. 358-282.000.

Tsuchiya, Yasuyuki; and Sakamoto, Hiroyuki, to Nippon Paint Co., Ltd. Water-based paint composition. 4,692,483, Cl. 523-406.000.

Tsuda, Tatsuya; and Nogi, Masako, to Sharp Kabushiki Kaisha. Heating appliance with uniform heating control. 4,692,597, Cl. 219-492.000.

Tsuda, Yoshiyuki: *See—*
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Tsudaka, Hideaki: *See—*
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.

Tsudakoma Kogyo Kabushiki Kaisha: *See—*
Takekawa, Yujiro; and Matsuda, Fumio, 4,691,745, Cl. 139-435.000.

Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, to Hitachi, Ltd. Multimedia display system. 4,692,757, Cl. 340-721.000.

Tsujihara, Sotohiro, to Ricoh Company, Ltd. Sheet reversing in copying machine and other sheet-handling machines. 4,692,020, Cl. 355-14.0SH.

Tsukamoto, Yoshinori: *See—*
Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, 4,692,414, Cl. 435-291.000.

Tsukamura, Kazuo: *See—*
Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, 4,692,519, Cl. 540-227.000.

Tsukimoto, Takayuki: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Tsunoda, Minoru: *See—*
Kadono, Kohji; and Tsunoda, Minoru, 4,691,800, Cl. 180-219.000.

Tufts College, Trustees of: *See—*
Dodman, Nicholas H.; and Shuster, Louis, 4,692,451, Cl. 514-282.000.

Tung, Francisca: *See—*
Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, 4,692,839, Cl. 361-386.000.

Tutco, Inc.: *See—*
Howard, H. Keith; and Sherrill, Jimmy L., 4,692,599, Cl. 219-532.000.

Tveryanovich, Eduard V.: *See—*
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

Twardowski, Zbigniew, to Tenneco Canada Inc. (ERCO division). Removal of arsenic from acids. 4,692,228, Cl. 204-105.00R.

Tzabanakis, Georges: *See—*
Tremblay, Paul; and Tzabanakis, Georges, 4,691,988, Cl. 350-96.230.

Ube Industries: *See—*
Kuriyama, Minoru; and Yamamoto, Tadashi, 4,691,755, Cl. 164-305.000.

Uchida, Hiroyuki. Photopolymerizable resin composition for producing aqueous-development type dry film resists. 4,692,396, Cl. 430-284.000.

Uchikata, Yoshio: *See—*
Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.

Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., to Standard Oil Company, The. Polymerization process for carboxyl containing polymers utilizing oil soluble ionic surface active agents. 4,692,502, Cl. 526-193.000.

Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, to Fujisawa Pharmaceutical Co., Ltd. 1,4-Dihydro[1]benzothiopyrano[4,3-c]pyrazole derivatives, compositions containing them, and pharmacological methods of using them. 4,692,444, Cl. 514-406.000.

Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, to Toyo Chemical Co., Ltd. Method for manufacturing corrugated tubes. 4,692,197, Cl. 156-189.000.

Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, to Mitsubishi Denki Kabushiki Kaisha. Ion beam generator. 4,692,627, Cl. 250-423.00P.

Uehara, Mitsuru: *See—*
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.

Uemura, Yahiro; and Funakoshi, Satoshi, to Green Cross Corporation, The. Gamma-globulin preparation for intravenous administration. 4,692,331, Cl. 424-85.000.

Uemura, Yukio: *See—*
Fujita, Masahiro; and Uemura, Yukio, 4,691,786, Cl. 173-12.000.

Ueno, Hiroshi: *See—*
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Ueno, Koichi: *See—*
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Ueno, Tetsuo: *See—*
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Uhlmann, Ernst: *See—*
Percival, Richard; and Uhlmann, Ernst, 4,691,434, Cl. 437-173.000.

Ujiie, Kazuaki: *See—*
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.

Ujiie, Noriaki: *See—*
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC.

Ukigaya, Fumio: *See—*
Aoki, Akira; and Ukigaya, Fumio, 4,692,804, Cl. 358-163.000.

Ukigaya, Tadashi; and Ogawa, Keizaburo, to Nikken Chemicals Co., Ltd. Sustained release pharmaceutical tablet of theophylline and production process thereof. 4,692,337, Cl. 424-469.000.

Ullman, Myron, to Dover Molded Products Company, The. Single finger-opening resilient cap. 4,691,839, Cl. 220-281.000.

Ultramed Corporation: *See—*
Parisi, Tulio T., 4,691,725, Cl. 134-184.000.

Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, to Fuji Machinery Company, Ltd. Method of tensioning a web of packaging material. 4,691,499, Cl. 53-451.000.

Umemoto, Mitsumasa: *See—*
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.

Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, to Asahi Denka Kogyo K.K. Molybdenum-containing lubricant composition. 4,692,256, Cl. 252-32.70E.

Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Ultrasonic transducer of monolithic array type. 4,692,654, Cl. 310-334.000.

Umeno, Hiroshi: *See—*
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.
Unger, Hans-Georg, to ANT Nachrichtentechnik GmbH. Single mode modified W-fiber. 4,691,991, Cl. 350-96.330.
Uni-Cardan Aktiengesellschaft: *See—*
Ehrlenspiel, Klaus; John, Thomas; and Streinz, Wolfgang, 4,692,126, Cl. 464-103.000.
Union Carbide Corporation: *See—*
Angell, Richard G., Jr., 4,692,291, Cl. 264-109.000.
Union Oil Company of California: *See—*
Ebenhack, Ben W.; and Floran, Robert J., 4,691,772, Cl. 166-254.000.
UNIPAT AG: *See—*
Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., 4,691,512, Cl. 60-456.000.
Uniroyal Chemical Company, Inc.: *See—*
Rowland, Donald G.; Hunter, Byron A.; and Hansen, Lee D., 4,692,475, Cl. 521-92.000.
United Aircraft Products, Inc.: *See—*
Gooden, Richmond A., 4,691,739, Cl. 138-31.000.
United Engineering Rolling Mills, Inc.: *See—*
Adair, James R., 4,691,549, Cl. 72-38.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Leigh, John W., 4,691,637, Cl. 102-406.000.
United States of America
Army: *See—*
Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, 4,692,732, Cl. 335-302.000.
Richter, Mark A., 4,692,367, Cl. 428-116.000.
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.
Sommer, Harold Z., 4,692,530, Cl. 546-261.000.
Commerce: *See—*
Spinelli, John; Stout, Virginia F.; and Nilsson, William B., 4,692,280, Cl. 260-420.000.
Health and Human Services: *See—*
Brossi, Arnold, 4,692,463, Cl. 514-463.000.
Interior: *See—*
Riley, William D.; and Brown, Robert D., Jr., 4,692,875, Cl. 364-497.000.
National Aeronautics and Space Administration: *See—*
Packard, Douglas T.; and Schmitt, Donald E., 4,692,674, Cl. 318-254.000.
Navy: *See—*
Bocker, Richard P.; and Miceli, William J., 4,692,885, Cl. 364-606.000.
Gegan, Michael J., 4,692,769, Cl. 343-700.0MS.
Vaughan, John C.; and Perkins, Russel G., Jr., 4,691,878, Cl. 244-7.00R.
U.S. Philips Corporation: *See—*
Clark, David G., 4,692,756, Cl. 340-709.000.
Fabien, Raymond; and Decrouen, Jean-Michel, 4,692,204, Cl. 156-626.000.
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,692,289, Cl. 264-61.000.
Kabacinski, Mariusz, 4,692,822, Cl. 360-84.000.
Khoe, Giok D.; and De Vrieze, Henricus M., 4,692,208, Cl. 156-659.100.
Larsson, Klas G. I.; Lindholm, Rolf C.; and Strom, Johan P., 4,691,616, Cl. 89-41.070.
Osinga, Halbe, 4,692,731, Cl. 335-299.000.
Rouws, Petrus L. A., 4,692,916, Cl. 369-75.200.
Roza, Engel; and Van Veenendaal, Hendrik G., 4,692,718, Cl. 331-113.00R.
Stikvoort, Eduard F.; van Roermund, Arthur H. M.; and Naus, Peter J. A., 4,692,737, Cl. 340-347.0DD.
United States Steel Corporation: *See—*
Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.
University of California, The Regents of the: *See—*
Hostetler, Karl Y.; and Deftos, Leonard J., 4,692,433, Cl. 514-12.000.
Sankar, Pat V., 4,691,707, Cl. 128-660.000.
University of Kentucky, Board of Trustees of the: *See—*
Kao, David T., 4,691,620, Cl. 92-80.000.
University of Miami: *See—*
Ryan, James W.; and Chung, Alfred, 4,692,437, Cl. 514-165.000.
Ryan, James W.; and Chung, Alfred, 4,692,458, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,692,459, Cl. 514-362.000.
University of Missouri, The Curators of the: *See—*
Yasuda, Hirotsuga K., 4,692,347, Cl. 427-40.000.
University of Pittsburgh: *See—*
Sashin, Donald; and Sternglass, Ernest J., 4,692,937, Cl. 378-062.000.
Unno, Shohei; Nakakawazi, Mikio; and Suzuki, Kazufumi, to Tokyo Electric Co., Ltd. Display apparatus. 4,692,760, Cl. 340-756.000.
UOP Inc.: *See—*
Chang, Chin-Hsiung, 4,692,514, Cl. 536-127.000.
Upton, Gain; and Spector, George. Rain detector. 4,692,751, Cl. 340-602.000.
Urso, Charles L. Safety heater. 4,691,688, Cl. 126-208.000.
Ursprung, Cecil: *See—*
Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, 4,691,892, Cl. 248-624.000.
Ushigome, Hideji. Forked shell and membrane stripper for boiled eggs. 4,691,440, Cl. 30-322.000.
Ushiro, Masayuki, to Nissan Motor Co., Ltd. Surplus warp yarn treating device of loom. 4,691,742, Cl. 139-1.00R.
Ussery, Hoyt D. Educational puzzle box. 4,692,119, Cl. 434-259.000.
Usui, Keizaburo: *See—*
Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, 4,691,584, Cl. 74-471.00R.
Utsumi, Takayuki: *See—*
Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, 4,692,012, Cl. 354-403.000.
Vaglini, Franco, to Siac Industria Accessori Cavaria S.p.A. Devices for applying terminals and similar metal elements to conductors, lengths of elastic material and the like. 4,691,437, Cl. 29-753.000.
Valentin, Walter: *See—*
Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, 4,692,026, Cl. 356-345.000.
Vallourec: *See—*
Fillet, Pierre R., 4,691,791, Cl. 175-320.000.
Valmet Oy: *See—*
Kerttula, Reima, 4,692,215, Cl. 162-289.000.
Van Buskirk, Ellor J.: *See—*
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.
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Vanetik, Anatoly; and Preston, Brian C., to Sanders Associates, Inc. Cutter assembly with rotating knife blade. 4,691,605, Cl. 83-175.000.
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Van Horssen, Charles A. Thread gauge. 4,691,441, Cl. 33-199.00R.
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Venot, Jean, to Societe Alsacienne de Construction de Material Textile. Method and device for removal of waste slivers in a weaving loom. 4,691,743, Cl. 139-291.00C.
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VerTech Treatment Systems, Inc.: *See—*
Atwood, Mark T.; Carlson, Frank; and Peterscheck, Hermann, 4,692,252, Cl. 210-761.000.
Veselka, Kenneth R. Adjustable single lock gutter broom mechanism. 4,691,402, Cl. 15-87.000.
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Vickers, PLC: *See—*
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Nishimoto, Naomichi, 4,692,814, Cl. 358-320.000.

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Martinez, Robert, 4,691,820, Cl. 206-205.000.

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Polanschutz, Wolfgang; Pochmarski, Luzian; and Moser, Alfred, 4,691,757, Cl. 164-416.000.

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Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

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von Werner, Konrad: *See*—
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Voris, Harvey C., to Paramount Fitness Corporation. Exercise apparatus with trolley system. 4,691,916, Cl. 272-118.000.

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Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, to Bristol-Myers Company. Trichloroethanimidic acid esters. 4,692,538, Cl. 558-6.000.

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Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

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Lampert, Ingolf; and Jacob, Herbert, 4,692,223, Cl. 204-34.500.

Wacker, Erich: *See*—
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Wada, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Integrated circuit device for writing and reading information. 4,692,785, Cl. 357-52.000.

Wada, Masatoshi; and Sakai, Tetsuo, to Okuno Chemical Industries Co. Ltd.; and Nippon Hoso Kyokai. High contrast display device. 4,692,662, Cl. 313-493.000.

Wada, Minoru: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.

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Homma, Takahiko; and Wada, Shigetaka, 4,692,099, Cl. 416-229.00A.

Wada, Yasuto; Ishiyama, Yoshihiko; and Yamashita, Makoto, to Ichikoh Industries, Ltd. Motor-driven collapsible door mirror. 4,692,000, Cl. 350-637.000.

Wadsworth, Legrand D. Ligature tool and process for castrating large animals. 4,691,704, Cl. 128-306.000.

Wagner, Alois, to Hasler AG Bern. Device for a force transmitting connection between two shafts. 4,692,127, Cl. 464-119.000.

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Sliger, Boyd P.; and Wagner, Joseph P., 4,691,861, Cl. 236-34.500.

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Killian, Edmund F.; and Berliner, Wallace H., 4,692,079, Cl. 411-353.000.

Waldron, Gerald E.; and Wilson, Edward J., to Dynapert-HTC Corp. Vapor level control for vapor processing system. 4,692,114, Cl. 432-198.000.

Wallace, John E., to Boeing Company, The. Universal matrix switching device. 4,692,578, Cl. 200-175.000.

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Kieninger, Walter, 4,692,069, Cl. 407-39.000.

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Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

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Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.

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Ward, Charles E.: *See*—
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Ward, Richard; and Allen, Archelaius D., to Dobson Park Industries Plc. Control systems. 4,692,067, Cl. 405-302.000.

Wardlow, Eddie, Jr.: *See*—
Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., 4,692,502, Cl. 526-193.000.

Ware, Charles H.; and Rose, Leslie C., to WorldEnergy Systems, Inc. Recovery of oil by in-situ combustion followed by in-situ hydrogenation. 4,691,771, Cl. 166-245.000.

Warmack, Ralph E.: *See*—
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Warner, Charles Y.: *See*—
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Warren, David: *See*—
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Washizuka, Isamu; and Kinugawa, Kiyoshi, to Sharp Kabushiki Kaisha. Key input device. 4,692,740, Cl. 340-365.00R.

Wassilieff, Victor. Apertured closure device with depressible disc portion. 4,691,836, Cl. 215-298.000.

Watanabe, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Drive arrangement for three wheeled vehicles. 4,691,799, Cl. 180-215.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,692,021, Cl. 355-14.00R.

Watanabe, Kazumasa: *See*—
Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, 4,692,393, Cl. 430-59.000.

Watanabe, Kouzou: *See*—
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.

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Watanabe, Yoji; Morimura, Toshio; and Toyoda, Yukio, to Showa Denko Kabushiki Kaisha. Apparatus for thermal cracking of or heating of hydrocarbons. 4,692,313, Cl. 422-241.000.

Watase, Hideo: *See—*
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Watkins, Gerald J.: *See—*
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Watthey, Jeffrey W. H., to CIBA-GEIGY Corporation. Propylamine derivatives. 4,692,469, Cl. 514-651.000.

Watts, John R. Deadlock with key operated locking cylinder. 4,691,543, Cl. 70-143.000.

Webb, Floyd A. Radial arm saw positioner. 4,691,607, Cl. 83-468.000.

Weber, Peter G., to Laitram Corp., The. Concealed drive coupling for use with modular screw conveyor. 4,691,818, Cl. 197-666.000.

Webster, Martyn F., to Oxoid Limited. Immunological identification test for group D streptococci using achromopeptidase. 4,692,417, Cl. 436-518.000.

Webster, R. D.: *See—*
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.

Wechter, Stephen R.: *See—*
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Wehmeyer, Donald T.; and Barnhart, Ronald W., to Economy Engineering, Inc. Vehicle fluidic drive circuit. 4,691,795, Cl. 180-6.480.

Wehr Corporation: *See—*
Cooley, Stephen E.; and Jensen, Martin J., 4,692,591, Cl. 219-295.000.

Wei, Ching-Yeu: *See—*
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,691,433, Cl. 437-44.000.

Weiss, Hardy P., to PRC Corporation. Method for improving the power of an axial gas laser. 4,692,928, Cl. 372-63.000.

Welch, M. Bruce, to Phillips Petroleum Company. Zinc aluminate double bond isomerization catalyst and process for its production. 4,692,430, Cl. 502-342.000.

Weller, Joseph P., to Dow Chemical Company, The. Hydrous oxide activated charcoal. 4,692,431, Cl. 502-417.000.

Welz, Martin; Czauderna, Bernhard; and Stoffel, Karl-Heinz, to BASF Aktiengesellschaft. Laminate bonded by adhesion promoting layer and adhesive layer. 4,692,373, Cl. 428-285.000.

Wem, James; and Brierley, Rowland J. P., to Imperial Chemical Industries plc. Centrifugal gas-liquid contact apparatus. 4,692,283, Cl. 261-89.000.

Wendling, Robert W.; Kurtz, John W.; and Perez, Juan M., to Texas Instruments Incorporated. Adjustable display stand. 4,691,886, Cl. 248-183.000.

Wenger, Alfred: *See—*
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.

Wernicke, Hans J.: *See—*
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Wesner, Charles R.; Yancey, John F.; and Coleman, Albert L., to Sperry Corporation. Adaptive autopilot. 4,692,868, Cl. 364-447.000.

Wessman, Borje. Swimming and bathing aid. 4,692,125, Cl. 441-112.000.

West, John G. W., to Lucas Electrical Electronics and Systems Limited. Engine cooling systems. 4,691,668, Cl. 123-41.120.

West, Lamar E., Jr., to Scientific Atlanta, Inc. Communications network. 4,692,919, Cl. 370-96.000.

West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., to FBC Limited. Acaricides. 4,692,457, Cl. 514-361.000.

Westermann, Donald H.: *See—*
Viswanathan, Tito; and Westermann, Donald H., 4,692,478, Cl. 527-300.000.

Western Digital Corporation: *See—*
Ouyang, Kenneth W.; and Marmet, Melvin, 4,692,717, Cl. 331-111.000.

Western Geophysical Company of America: *See—*
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Westinghouse Brake and Signal Co., Ltd.: *See—*
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Westinghouse Electric Corp.: *See—*
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Crew, Albert W.; Ghrist, William D., III; and Remley, Gilbert W., 4,692,299, Cl. 376-216.000.
DeMario, Edmund E.; Boyle, Raymond F.; and Kuchirka, Peter J., 4,692,302, Cl. 376-439.000.
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Isenberg, Arnold O.; and Ruka, Roswell J., 4,692,274, Cl. 252-521.000.
Israelson, Gordon A., 4,692,176, Cl. 55-302.000.
Schlonski, James S.; and Burnett, Tobias W. T., 4,692,297, Cl. 376-211.000.
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.

Westphal, Georg P. Nuclear and X-ray spectrometry and low-pass filter and filtering method therefor. 4,692,626, Cl. 250-389.000.

Westward Investments Limited: *See—*
Lackinger, Franz, 4,692,563, Cl. 174-65.0SS.

Weyant, Robert R., to American Hospital Supply Corporation. Power system for infusion pumps. 4,692,145, Cl. 604-65.000.

Weyer, Paul P. Thin profile rotary actuator with backlash elimination. 4,691,582, Cl. 74-409.000.

Wheeler, Bryce A., to Hughes Aircraft Company. Afocal beam expansion apparatus and method. 4,691,999, Cl. 350-620.000.

Wheeler, Dale E., to Hughes Tool Company. Method and means for sealing electrical conductor rods in a tubular housing. 4,691,430, Cl. 29-451.000.

Whigham, Robert H., to Telectronics N.V. Combined pacemaker delta modulator and bandpass filter. 4,692,719, Cl. 332-11.00D.

Whitley, George J.: *See—*
Keeler, Brian G.; and Whitley, George J., 4,691,419, Cl. 29-39.000.

Whitney, Thomas H., to Trayco, Inc. Joint and trim for bathtubs and the like. 4,691,392, Cl. 4-595.000.

Whitten, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., to Midrex International, B.V. Screen sizer. 4,691,868, Cl. 241-24.000.

Whyco Chromium Company, Inc.: *See—*
Hyner, Jacob; and Gradowski, Steven, 4,692,080, Cl. 411-387.000.

Wiberg, Per-Arne. Method and apparatus for drying a moist fibre web. 4,691,449, Cl. 34-9.000.

WIC, Inc.: *See—*
Schwitters, Wayne J., 4,691,506, Cl. 56-121.400.
Schwitters, Wayne J., 4,691,507, Cl. 56-121.400.

Wicklund, L. Harvey: *See—*
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Widhalm, Michael J.; and Widhalm, Thomas G. Flip-over lamp bracket for vehicles. 4,692,845, Cl. 362-80.000.

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Widhalm, Michael J.; and Widhalm, Thomas G., 4,692,845, Cl. 362-80.000.

Widlund, Leif U. R.; and Ternstrom, Maj I., to Molnlycke AB. Absorption article such as a diaper or a sanitary napkin, and a method for the manufacture thereof. 4,692,163, Cl. 604-385.00A.

Wiley, Lawrence V.: *See—*
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Wilkins, Howard: *See—*
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Willburger, Ulrich. Cleaning cassette for high speed cassette recorders including manually operable drive means. 4,692,830, Cl. 360-128.000.

Wille, Milton G.: *See—*
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William H. Rorer, Inc.: *See—*
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Williams, Kevin G.: *See—*
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Williams, R. Tudor. Carbon dioxide detector. 4,691,701, Cl. 128-207.140.

Williams, Robert J.: *See—*
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Williamson, Jimmie R., Jr., to Otis Engineering Corporation. Standing and injection valve. 4,691,777, Cl. 166-319.000.

Willyard, Dewey L., Jr.; Cline, David E.; and Wulfhorst, David E., to Cummins Atlantic, Inc. Method for remanufacturing a compressor housing. 4,691,423, Cl. 29-156.40R.

Wilmot, Richard A.: *See—*
Raizen, David T.; and Wilmot, Richard A., 4,692,742, Cl. 340-539.000.

Wilson, David J. M.; and Cope, Paul E. G., to Marconi Company Limited, The. Rotational motion fluid loop sensor using magnetically levitated detecting element. 4,692,614, Cl. 250-231.00R.

Wilson, Earl C.: *See—*
Possley, Glen G.; and Wilson, Earl C., 4,692,787, Cl. 357-59.000.

Wilson, Edward J.: *See—*
Waldron, Gerald E.; and Wilson, Edward J., 4,692,114, Cl. 432-198.000.

Wilson, James W. Expandable deck system. 4,691,484, Cl. 52-79.600.

Wilson, John F.: *See—*
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.

Wimbush, Maurice J., to Automotive Products plc. Clutch release mechanism. 4,691,814, Cl. 192-91.00A.

Windmoller & Holscher: *See—*
Winnemoller, Aloys, 4,691,603, Cl. 83-151.000.

Winnemoller, Aloys, to Windmoller & Holscher. Cutting apparatus for cutting sheet material. 4,691,603, Cl. 83-151.000.

Winner, Sol N. Airline electrical ground cable feed out and retrieval storage apparatus. 4,692,569, Cl. 191-12.00R.

Winslow, Donald W.: *See—*
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.

Winter, Alfred: *See—*
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

Winterhalter, Walter; and Halssig, Andreas, to Gebruder Junghans GmbH. Safety fuse for a spinning-type projectile. 4,691,635, Cl. 102-251.000.

Wintershall AG: *See—*
Lindorfer, Walter; and Jahn-Held, Wilhelm, 4,692,061, Cl. 405-128.000.

Wisneski, Tony J.: *See*—
Morman, Michael T.; and Wisneski, Tony J., 4,692,371, Cl. 428-224.000.

Witco Corporation: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,692,427, Cl. 502-160.000.

Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, to Rheinmetall GmbH. Exploding missile. 4,691,636, Cl. 102-387.000.

Wittmer, Marc F.: *See*—
Rubloff, Gary W.; and Wittmer, Marc F., 4,692,348, Cl. 437-82.000.

Witucki, Edward F.; Warren, Leslie F., Jr.; and Newman, Paul R., to Rockwell International Corporation. Method of stabilizing conductive polymers. 4,692,225, Cl. 204-59.00R.

Wodiczka, Ernst: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Wolf, Albert E., to Checkpoint Systems, Inc. Article security system. 4,692,747, Cl. 340-572.000.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Spinning of twisting machine with a drive belt performance monitor. 4,691,508, Cl. 57-78.000.

Wolff, George: *See*—
Ellion, M. Edmund; and Wolff, George, 4,692,559, Cl. 136-262.000.

Wolff Walsrode Aktiengesellschaft: *See*—
Schinkel, Ingo; and Bohner, Jurgen, 4,692,386, Cl. 428-515.000.

Wolk, Petra: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., to Adamtek Corporation; and Hibshman Corporation, a part interest. Rheological testing apparatus and method. 4,691,714, Cl. 128-738.000.

Wong, Marcus Y.: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Woo, Chi Goo. Collapsible hammock. 4,691,394, Cl. 5-120.000.

Wood, Geoffrey B.: *See*—
Irvine, Sheila M.; Penman, Alistair; and Wood, Geoffrey B., 4,692,338, Cl. 426-2.000.

Wood, Roy F., to Phillips Petroleum Company. Pipeline lining. 4,691,740, Cl. 138-109.000.

Woodhead, David A.: *See*—
Bodolus, Christopher L.; and Woodhead, David A., 4,692,498, Cl. 525-285.000.

Woodstream Corporation: *See*—
Landell, Harper; and Woolworth, Richard G., 4,691,470, Cl. 43-55.000.

Woodward, Robert B.: *See*—
Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.

Woolworth, Richard G.: *See*—
Landell, Harper; and Woolworth, Richard G., 4,691,470, Cl. 43-55.000.

WorldEnergy Systems, Inc.: *See*—
Ware, Charles H.; and Rose, Leslie C., 4,691,771, Cl. 166-245.000.

Wossmann, Reinhard: *See*—
Haver, Eitel F.; Lutke-Foller, Heinz; and Wossmann, Reinhard, 4,691,744, Cl. 139-425.00R.

Wozniczka, George, to Zenith Electronics Corporation. Heat sink. 4,691,765, Cl. 165-80.300.

Wright, Allen B.; and Chichester, Willard L., to Allied Corporation. Simplified air filter. 4,692,177, Cl. 55-499.000.

Wright, David A.: *See*—
Pitches, Brian E.; and Wright, David A., 4,691,446, Cl. 33-516.000.

Wright, Thomas C.; and Johnson, Grover L., to Orin Chemical Company. Water borne polymer foamable composition. 4,692,473, Cl. 521-72.000.

Wroblewski, David J.; and Robertson, John W., Jr., to Babcock & Wilcox Company, The. Electro-mechanical integrator. 4,692,933, Cl. 377-29.000.

Wu, Schyi-Yi: *See*—
Price, J. B.; and Wu, Schyi-Yi, 4,692,343, Cl. 427-38.000.

Wu, Shang-Ren: *See*—
Howland, Warren W.; Arquette, Robert E.; and Wu, Shang-Ren, 4,692,169, Cl. 44-51.000.

Wuerzer, Bruno: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.

Wulfhorst, David E.: *See*—
Willyard, Dewey L., Jr.; Cline, David E.; and Wulfhorst, David E., 4,691,423, Cl. 29-156.40R.

Wurz, Dieter; and Paikert, Paul. Finned tube arrangement for heat exchangers. 4,691,766, Cl. 165-135.000.

Wurzer, Bruno: *See*—
Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, 4,692,187, Cl. 71-107.900.

Wyatt, James G., Jr.: *See*—
Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., 4,692,746, Cl. 340-572.000.

Xerox Corporation: *See*—
Loce, Robert P.; Rees, James D.; and Durbin, John A., 4,692,015, Cl. 355-1.000.
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Y. S. Securities Limited: *See*—
Oakes, Martin C., 4,692,733, Cl. 337-158.000.

Yabe, Masaya: *See*—
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, 4,692,782, Cl. 357-29.000.

Yabe, Yukihiko: *See*—
Suzuki, Seigo; Yabe, Yukihiko; and Kawakami, Masumi, 4,692,640, Cl. 307-464.000.

Yadlosky, John M.: *See*—
Kim, Jai B.; and Yadlosky, John M., 4,691,399, Cl. 14-2.000.

Yagi, Harumi, to Fujitsu Limited. Twin wire splitter system. 4,691,855, Cl. 228-4.500.

Yamada, Kiyoshi: *See*—
Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, 4,692,812, Cl. 358-285.000.

Yamada, Koji: *See*—
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Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, to Nakano Vinegar Co., Ltd. Apparatus for automatically controlling the feed rate of alcohol solution as raw material in a vinegar production process. 4,692,414, Cl. 435-291.000.

Yamada, Mitsuhiko; Fujisawa, Kyohei; and Kitamura, Hideaki, to Dainippon Screen Mfg. Co., Ltd. Method for manufacturing electric masks using a color scanner and an apparatus for use therein. 4,692,796, Cl. 358-76.000.

Yamaguchi, Akihiro: *See*—
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.

Yamaguchi, Hiroyuki: *See*—
Moriya, Mitsuro; Shiragami, Kazuharu; and Yamaguchi, Hiroyuki, 4,692,915, Cl. 369-53.000.

Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Process for producing 1,3-bis(3-aminophenoxy)benzene. 4,692,554, Cl. 564-430.000.

Yamaguchi, Tatsuo: *See*—
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.

Yamaguchi, Tomoyoshi: *See*—
Fukunaga, Masami; and Yamaguchi, Tomoyoshi, 4,691,975, Cl. 439-266.000.

Yamaguchi, Toshiharu: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Watanabe, Hiromitsu, 4,691,799, Cl. 180-215.000.

Yamaha Motor Co., Ltd.: *See*—
Fuchigami, Wataru; and Nakayama, Yoshiharu, 4,692,129, Cl. 474-148.000.

Yamamoto, Masahiro: *See*—
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.

Yamamoto, Mitsuoki: *See*—
Suzuki, Yoshio; Yamamoto, Mitsuoki; and Hosomi, Hisashi, 4,692,065, Cl. 405-211.000.

Yamamoto, Ryoichi: *See*—
Mineshima, Hideo; Koda, Haruyuki; and Yamamoto, Ryoichi, 4,692,501, Cl. 526-65.000.

Yamamoto, Tadashi: *See*—
Kuriyama, Minoru; and Yamamoto, Tadashi, 4,691,755, Cl. 164-305.000.

Yamamura, Yasuharu: *See*—
Sekido, Satoshi; Tachibana, Hirokazu; and Yamamura, Yasuharu, 4,692,429, Cl. 502-303.000.

Yamaoka, Akira; Wada, Kenichi; and Kuriyama, Kazunori, to Hitachi, Ltd. Coded decimal non-restoring divider. 4,692,891, Cl. 364-763.000.

Yamashita, Makoto: *See*—
Wada, Yasuto; Ishiyama, Yoshihiko; and Yamashita, Makoto, 4,692,000, Cl. 350-637.000.

Yamato Scientific Co., Ltd.: *See*—
Yoshida, Naoki; and Kobayashi, Nobutoshi, 4,692,598, Cl. 219-497.000.

Yamaura, Yutaka: *See*—
Kumatani, Hiroshi; and Yamaura, Yutaka, 4,691,588, Cl. 74-512.000.

Yamazaki, Hideo: *See*—
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.

Yamazaki, Hiroshi: *See*—
Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, 4,692,393, Cl. 430-59.000.

Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, to Semiconductor Energy

Laboratory Co., Ltd. Liquid crystal filling device. 4,691,995, Cl. 350-331.00R.

Yamazaki, Takeo: *See—*
Shoji, Moritaka; Yamazaki, Takeo; and Ogihara, Satoru, 4,692,735, Cl. 338-21.000.

Yanagawa, Nobuhide: *See—*
Morita, Shigeru; and Yanagawa, Nobuhide, 4,692,086, Cl. 414-635.000.

Yancey, John F.: *See—*
Wesner, Charles R.; Yancey, John F.; and Coleman, Albert L., 4,692,868, Cl. 364-447.000.

Yang, Tai-Her. C-clamp structure. 4,691,907, Cl. 269-152.000.

Yang, Tai-Her. Ceiling fan. 4,692,096, Cl. 416-170.00R.

Yao, Hiroyuki; and Okamoto, Yuji, to Toyota Jidosha Kabushiki Kaisha. Vehicle door structure. 4,691,476, Cl. 49-374.000.

Yasuda, Hirotsuga K., to University of Missouri, The Curators of the. Method of interiorly coating tubing. 4,692,347, Cl. 427-40.000.

Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, to Canon Kabushiki Kaisha. Reproducing device for frequency modulated signals. 4,692,914, Cl. 369-49.000.

Yasuzawa, Tohru: *See—*
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, to Mitsui Petrochemical Industries, Ltd. Five-component copolyester, process for preparation thereof, and shaped articles thereof. 4,692,506, Cl. 528-296.000.

Yawn, David H.: *See—*
Feldman, Louis W.; and Yawn, David H., 4,692,136, Cl. 494-38.000.

Yazaki Corporation: *See—*
Tongu, Shinji, 4,691,528, Cl. 62-238.300.

Yee, Alfred A., to Yee, Elizabeth W. Splice sleeve for overlapping reinforcing bars. 4,692,052, Cl. 403-13.000.

Yee, Elizabeth W.: *See—*
Yee, Alfred A., 4,692,052, Cl. 403-13.000.

Yeshiva University: *See—*
Diamond, Betty A., 4,692,416, Cl. 436-508.000.

Yli-Koski, Esko T.: *See—*
Pyotsia, Jouni K.; and Yli-Koski, Esko T., 4,691,894, Cl. 251-127.000.

Yokohama Rubber Co., Ltd.: *See—*
Kabe, Kazuyuki; and Morikawa, Tuneo, 4,691,752, Cl. 152-527.000.

Yokoi, Satoru; and Kondo, Hirokazu, to Tsubakimoto Chain Company. Load testing apparatus for electronic components. 4,692,694, Cl. 324-158.00F.

Yokota, Fumiki: *See—*
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Yokoyama, Makoto, to Kawamura Electric Industry Co., Ltd. Optical pulse receiving device. 4,692,687, Cl. 323-284.000.

Yonamine, Shozen: *See—*
Ikeda, Sakio; and Yonamine, Shozen, 4,691,717, Cl. 131-365.000.

Yonemochi, Katsutoshi: *See—*
Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, 4,691,998, Cl. 350-616.000.

Yorisue, Shozo; and Morimoto, Seiji, to Precision Fukuhara Works, Ltd. Dust removing device for circular knitting machine. 4,691,536, Cl. 66-168.000.

Yoshida, Hajime, to Hajime Industries Ltd. Automatic inspection device. 4,692,800, Cl. 358-106.000.

Yoshida, Katsumi: *See—*
Toyoda, Yasuhiro; Shimada, Fumio; and Yoshida, Katsumi, 4,692,009, Cl. 354-246.000.

Yoshida, Naoki; and Kobayashi, Nobutoshi, to Yamato Scientific Co., Ltd. Temperature controller system. 4,692,598, Cl. 219-497.000.

Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, to Hitachi Construction Machinery Co., Ltd.; and Tokyo Gas Co., Ltd. Lateral hole boring method and apparatus. 4,691,788, Cl. 175-62.000.

Yoshida, Takeshi: *See—*
Hayakawa, Masaru; Yoshida, Takeshi; and Kaiya, Atsushi, 4,691,759, Cl. 164-526.000.

Yoshida, Taro: *See—*
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Yoshida, Tatumasa: *See—*
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,692,725, Cl. 333-203.000.

Yoshida, Toshihiko: *See—*
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,692,206, Cl. 156-649.000.

Yoshikawa, Shoji: *See—*
Sakai, Mitsugu; and Yoshikawa, Shoji, 4,692,606, Cl. 250-205.000.

Yoshikawa, Yukihiro: *See—*
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.

Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, to Mitsui Toatsu Chemicals, Incorporated. N-(2-chloro-4-trifluoromethylphenyl)-3-trifluoromethylbenzenesulfonamide derivative and agricultural fungicide containing same. 4,692,466, Cl. 514-604.000.

Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, to Canon Kabushiki Kaisha. Image formation apparatus with a recording unit and paper feed cover and a sealing member. 4,692,778, Cl. 346-145.000.

Yoshitomi, Yasunari; Kuroki, Katsuro; and Iwayama, Kenzo, to Nippon Steel Corporation. Process for producing a grain-oriented electrical steel sheet having a low watt loss. 4,692,193, Cl. 148-111.000.

Yotsuuye, David S.: *See—*
King, Ethmer W.; Kircher, Robert C., Jr.; and Yotsuuye, David S., 4,692,869, Cl. 364-448.000.

Young, Quentin H., to Southern Steel Company. Door locking system. 4,691,542, Cl. 70-129.000.

Young, Ronald W., to British Aerospace PLC. Co-operative satellites. 4,691,882, Cl. 244-158.00R.

Yung, Richard C. S.: *See—*
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.

Zabrodsky, John, III: *See—*
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Zahn, Wolfgang: *See—*
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.

Zahnradfabrik Friedrichshafen AG: *See—*
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Zaidan Hojin Handotai Kenkyu Shinkokai: *See—*
Nishizawa, Jun-ichi, 4,692,194, Cl. 437-120.000.

Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., to Institute Electrosvarki Imeni Patona. Apparatus for a-c arc welding with a consumable electrode. 4,692,585, Cl. 219-130.400.

Zastrow, Thomas S., to Remmele Engineering, Inc. Apparatus for supporting the walls of appliances and the like during foaming. 4,691,906, Cl. 269-48.100.

Zavalishin, Nikolai N.: *See—*
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.

Zdunek, Kenneth J., to Motorola, Inc. Dispatch trunked radio system. 4,692,945, Cl. 455-17.000.

Zeiss, Hans-Joachim; and Mildenberger, Hilmar, to Hoechst Aktiengesellschaft. Phosphorus-containing α-amino nitriles and a process for their preparation. 4,692,541, Cl. 558-87.000.

Zenith Electronics Corporation: *See—*
Adler, Robert; and Strauss, Paul, 4,692,660, Cl. 313-477.00R.
Borg, Arthur N.; and Bar-Hai, Giora, 4,692,903, Cl. 365-226.000.
Wozniczka, George, 4,691,765, Cl. 165-80.300.

Zenzefilis, George E. Disc memory storage apparatus and method, 4,692,821, Cl. 360-78.000.

Ziegenbein, Botho: *See—*
Reiss, Harald; and Ziegenbein, Botho, 4,692,363, Cl. 428-36.000.

Ziegler, Craig A.: *See—*
Fiedziuszko, Slawomir J.; and Ziegler, Craig A., 4,692,723, Cl. 333-202.000.

Ziegler, Rudolf: *See—*
Eberhardt, Werner; and Ziegler, Rudolf, 4,692,263, Cl. 252-122.000.

Zimmer, Gabriele, to pfm, Plastik fur die Medizin GmbH. Catheter. 4,692,155, Cl. 604-177.000.

Zimmern, Bernard. Refrigeration system with a centrifugal economizer. 4,691,533, Cl. 62-512.000.

Zinn, Frank R., to Bingham & Taylor. Undercover valve cover assembly and valve support. 4,691,733, Cl. 137-364.000.

Zinser Textilmaschinen GmbH: *See—*
Wolf, Horst, 4,691,508, Cl. 57-78.000.

Zodrow, Rudolf; and Tomashauser, Josef, to Jagenberg Aktiengesellschaft. Smoothing and pressing down device in labeling machines. 4,692,201, Cl. 156-488.000.

Zorb, Larry D.; and Wicklund, L. Harvey, to A. Y. McDonald Manufacturing Co. Flow conditioning device resetter assembly. 4,691,727, Cl. 137-15.000.

Zorcher, Heinz: *See—*
Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, 4,692,930, Cl. 373-72.000.

Zubretzky, Jeno: *See—*
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Zunft, Hans-Joachim: *See—*
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Zunkel, Gary D.: *See—*
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.

Zylka, Stephen H.: *See—*
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

102160 Canada Inc.: *See—*
Farfan de los Godos, Henry F., 4,691,696, Cl. 128-78.000.

2500 Corporation, The: *See—*
Altus, Mark, 4,692,364, Cl. 428-85.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anahara, Meiji; and Muramatsu, Shigeru, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Friction spinning frame. Re. 32,494, Cl. 57-401.000.

Canfield, Douglas M., to Casso Solar Corporation. Glass furnace with heat sensing means. Re. 32,497, Cl. 65-162.000.

Cars & Concepts, Inc.: *See*—
Chrysler, Richard R., Re. 32,496, Cl. 296-218.000.

Casso Solar Corporation: *See*—
Canfield, Douglas M., Re. 32,497, Cl. 65-162.000.

Chrysler, Richard R., to Cars & Concepts, Inc. Removable roof panels for vehicles. Re. 32,496, Cl. 296-218.000.

Coates, J. Randall, to Smith International, Inc. Chip relief for rock bits. Re. 32,495, Cl. 175-339.000.

Hitachi, Ltd.: *See*—
Tomita, Yoshifumi; and Nakai, Hiromitsu, Re. 32,498, Cl. 430-28.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Anahara, Meiji; and Muramatsu, Shigeru, Re. 32,494, Cl. 57-401.000.

Mansell, Richard L.: *See*—
Weiler, Elmar W.; and Mansell, Richard L., Re. 32,499, Cl. 435-7.000.

Muramatsu, Shigeru: *See*—
Anahara, Meiji; and Muramatsu, Shigeru, Re. 32,494, Cl. 57-401.000.

Nakai, Hiromitsu: *See*—
Tomita, Yoshifumi; and Nakai, Hiromitsu, Re. 32,498, Cl. 430-28.000.

Smith International, Inc.: *See*—
Coates, J. Randall, Re. 32,495, Cl. 175-339.000.

Tomita, Yoshifumi; and Nakai, Hiromitsu, to Hitachi, Ltd. Method of manufacturing fluorescent screens of cathode ray tubes. Re. 32,498, Cl. 430-28.000.

University of South Florida: *See*—
Weiler, Elmar W.; and Mansell, Richard L., Re. 32,499, Cl. 435-7.000.

Weiler, Elmar W.; and Mansell, Richard L., to University of South Florida, a part interest. Method for quantitative analysis for limonin. Re. 32,499, Cl. 435-7.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Application Art Laboratories Co., Ltd.: *See*—
Morita, Tamao, B1 4,021,891, Cl. 24-303.000.

Bhatia, Kishan: *See*—
Burnes, Edward E.; and Bhatia, Kishan, B1 4,515,759, Cl. 423-220.000.

Burnes, Edward E.; and Bhatia, Kishan, to NL Industries, Inc. Process of removing hydrogen sulfide from gas mixtures. B1 4,515,759, 9-8-87, Cl. 423-220.000.

Dow Chemical Co., The: *See*—
Havens, Carl B., B1 4,315,963, Cl. 428-35.000.

Havens, Carl B., to Dow Chemical Co., The. Thermoplastic film with integral ribbed pattern and bag therefrom. B1 4,315,963, 9-8-87, Cl. 428-35.000.

Morita, Tamao, to Application Art Laboratories Co., Ltd. Magnetic lock closure. B1 4,021,891, 9-8-87, Cl. 24-303.000.

NL Industries, Inc.: *See*—
Burnes, Edward E.; and Bhatia, Kishan, B1 4,515,759, Cl. 423-220.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Larkin, Mark E.; Tripp, Edward S.; and Johnson, Richard A., 291,828, Cl. D24-56.000.

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Bean, Lewis. Folding walker. 291,791, 9-8-87, Cl. D12-130.000.

Beaty, Ulysses C. Protective shield for shoe heels. 291,741, 9-8-87, Cl. D2-277.000.

Benoit, Raymond A. Flashlight. 291,836, 9-8-87, Cl. D26-37.000.

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Bunge, John M. Storage and carrying container for an electric drill and accessories. 291,747, 9-8-87, Cl. D3-30.100.

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Caulkins, Earl R. Collar ornament. 291,788, 9-8-87, Cl. D11-213.000.

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Chap, John P., to Selfix, Inc. Bag organizer. 291,756, 9-8-87, Cl. D6-566.000.

Chasen, Lee R.: *See*—
Dunn, James R.; and Chasen, Lee R., 291,763, Cl. D7-105.000.

Clarke, Michael J.; Santarsiero, Paul S.; and Kearney, John P., to Coleco Industries, Inc. Children's ride-on simulated dump truck. 291,790, 9-8-87, Cl. D12-108.000.

Clemens, Kevin F., to Michelin Recherche et Technique. Tire. 291,792, 9-8-87, Cl. D12-147.000.

Clemens, Kevin F., to Michelin et Recherche et Technique. Tire. 291,793, 9-8-87, Cl. D12-147.000.

Clemens, Kevin F., to Michelin Recherche et Technique. Tire. 291,794, 9-8-87, Cl. D12-147.000.

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Conway, Ronald I.; Lucente, Samuel A.; and Schaum, David L., to International Business Machines Corporation. Multiple control element unit for data processing apparatus. 291,806, 9-8-87, Cl. D14-114.000.

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Denny, Thomas, to Johnson & Johnson Products Inc. Surgical laparotomy pad. 291,827, 9-8-87, Cl. D24-34.000.

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Durand, Jean-Jacques. Condiment shaker or similar article. 291,759, 9-8-87, Cl. D7-54.000.

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Fogarty, A. Edward; Fogarty, Bonnie R.; and Danna, Sabrina M., to Hasbro-Bradley. Finger puppet or similar article. 291,817, 9-8-87, Cl. D21-153.000.

Fogarty, Bonnie R.: *See*—
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Forsse, Earl K., to Alchemy II, Inc. Talking bear. 291,818, 9-8-87, Cl. D21-159.000.

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Gingras, Eric G., to Security Imprinter Corporation. Variable data imprinter. 291,812, 9-8-87, Cl. D18-14.000.

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Gisiger, Urs, to Amiet AG. Luggage lock. 291,773, 9-8-87, Cl. D8-331.000.

Gisiger, Urs, to Amiet AG. Luggage lock. 291,774, 9-8-87, Cl. D8-341.000.

Gisiger, Urs, to Amiet AG. Luggage lock. 291,775, 9-8-87, Cl. D8-341.000.

Goldman, Jerome; Goldman, Marvin; and Phillips, Gerald, to Penn Plax Plastics, Inc. Aquarium filter cartridge. 291,825, 9-8-87, Cl. D23-4.000.

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Goldman, Jerome; Goldman, Marvin; and Phillips, Gerald, 291,825, Cl. D23-4.000.

Griswold, Judith. Combined book and magazine display. 291,754, 9-8-87, Cl. D6-553.000.

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Guttormson, Fred E., to C. R. Mfg. Co. Dispensing nozzle for container. 291,780, 9-8-87, Cl. D9-447.000.

Hansen, Ole Q., to Buffalo Medical Specialties, Mfg., Inc. Medical implement case. 291,745, 9-8-87, Cl. D3-30.100.

Harris, Michael. Pop top chess game piece. 291,815, 9-8-87, Cl. D21-52.000.

Hasbro-Bradley: *See*—
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Jasper, Robert S. Guitar pick. 291,809, 9-8-87, Cl. D17-20.000.

Jen, Yen-Shen. Engraver for finger ring and bracelet. 291,811, 9-8-87, Cl. D18-13.000.

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Larkin, Mark E.; Tripp, Edward S.; and Johnson, Richard A., to Abbott Laboratories. Vial enclosure. 291,828, 9-8-87, Cl. D24-56.000.

Lathrop, Bethany, to Aloys F. Dornbracht GmbH & Co. Faucet knob. 291,824, 9-8-87, Cl. D23-28.000.

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Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.

Liu, King. Exercise bicycle. 291,822, 9-8-87, Cl. D21-194.000.

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Lundstrom, Lars-Birger, to HB Megaron. Structural beam. 291,832, 9-8-87, Cl. D25-77.000.

Maddock, Mitchell E. Flow controller valve. 291,826, 9-8-87, Cl. D23-19.000.

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Mantell, Robert D. Implement for activating and deactivating a telephone hook switch. 291,802, 9-8-87, Cl. D14-59.000.

Mantell, Robert D. Implement for activating and deactivating a telephone hook switch. 291,803, 9-8-87, Cl. D14-59.000.

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Michelin Recherche et Technique: *See*—
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Rahme, Selim R. Adaptor for adjusting the aim of an automobile headlight. 291,786, 9-8-87, Cl. D10-46.000.

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Chap, John P., 291,756, Cl. D6-566.000.

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Suzuki, Takeshi; and Takahashi, Mamoru, to NEC Corporation. Combination handset and stand cellular telephone unit. 291,801, 9-8-87, Cl. D14-53.000.

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Takami, Masaho, to Shoko Kiko Co., Ltd. Anvil for a stapler. 291,770, 9-8-87, Cl. D8-50.000.

Those Characters From Cleveland, Inc.: *See*—
Schneider, Thomas P.; and Trentel, Susan E., 291,819, Cl. D21-161.000.

Tip Top Corporation: *See*—
Mark, Irving L., 291,764, Cl. D7-151.000.
Torongo, Albert H.; and Aldrich, Thomas B., III, to Gillette Company, The. Nebulizer. 291,829, 9-8-87, Cl. D24-62.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Sasaoka, Ryoichi, 291,795, Cl. D12-163.000.
Trentel, Susan E.: *See*—
Schneider, Thomas P.; and Trentel, Susan E., 291,819, Cl. D21-161.000.
Tripp, Edward S.: *See*—
Larkin, Mark E.; Tripp, Edward S.; and Johnson, Richard A., 291,828, Cl. D24-56.000.
Tung, Tse T., to Motor Electric Manufacturing Co., Ltd. Rechargeable flashlight. 291,838, 9-8-87, Cl. D26-48.000.
Tunturipyora OY: *See*—
Kiiski, Heikki, 291,821, Cl. D21-192.000.
Uniden Corporation: *See*—
George, David L., 291,804, Cl. D14-64.000.
Van de Merwe, Jan, III: *See*—
Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.
Vandergeest, Fred. Door closer. 291,771, 9-8-87, Cl. D8-330.000.
W. Braun Company: *See*—
Rosenwinkel, Karen A., 291,778, Cl. D9-413.000.
W. C. Bradley Enterprises, Inc.: *See*—
Murphy, Armand, 291,768, Cl. D7-408.000.
Wood, Earl M., Jr.: *See*—
Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.
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van der Jagt, Martinus, 6,005, Cl. 74.000.
H. P. Metzler & Sons: *See*—
Chamberlin, Thomas O., Sr., 6,006, Cl. 38.000.
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Chamberlin, Thomas O., Sr., 6,008, Cl. 43.000.
Sheehan, Timothy P.: *See*—
Weinberger, John H.; and Sheehan, Timothy P., 6,009, Cl. 47.000.
van der Jagt, Martinus, to Chrysanthemum Breeders Association, N.V. Chrysanthemum plant named 'Reyellow'. 6,005, 9-8-87, Cl. 74.000.
Weinberger, John H.; and Sheehan, Timothy P. Grapevine, sugrasix. 6,009, 9-8-87, Cl. 47.000.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 8, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

161 A 4,691,387
4,691,388
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CLASS 4

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164 4,691,604
175 4,691,605
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33.4 4,691,615
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CLASS 91

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CLASS 92

80 4,691,620
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2.18 4,691,623
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289 4,692,200
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289 WC 4,691,933
503 4,691,934
507 4,691,935
615 4,691,936
711 4,691,937
804 4,691,938
806 4,691,939

CLASS 283

70 4,691,940

CLASS 285

1 4,691,941
84 4,691,942
315 4,691,943
348 4,691,944
419 4,691,945

CLASS 290

55 4,692,631

CLASS 292

171 4,691,948
216 4,691,949
269 4,691,950
337 4,691,951
341.18 4,691,952

CLASS 294

19.1 4,691,953
54.5 4,691,954
142 4,691,955

CLASS 296

37.8 4,691,960
51 4,691,956
98 4,691,957
146 4,691,958
184 4,691,959
218 Re.32,496

CLASS 297

61 4,691,961
84 4,691,962
195 4,691,963
330 4,691,964
440 4,691,965
452 4,691,966

CLASS 299

1 4,691,967

CLASS 303

52 4,691,968
113 4,691,969

CLASS 307

66 4,692,632
269 4,692,633
272.1 4,692,634
279 4,692,635
427 4,692,636
443 4,692,637
449 4,692,638
4,692,639
464 4,692,640
475 4,692,641
530 4,692,642
584 4,692,643

CLASS 310

178 4,692,644
184 4,692,645
4,692,646
212 4,692,647
233 4,692,648
316 4,692,649
323 4,692,650
4,692,651
4,692,652
334 4,692,653
4,692,654

CLASS 312

257 SK 4,691,970

CLASS 313

15 4,692,655
113 4,692,656
130 4,692,657
365 4,692,658
402 4,692,659
477 R 4,692,660
485 4,692,661
493 4,692,662
495 4,692,663

CLASS 315

60 4,692,664
169.4 4,692,665
4,692,666
209 R 4,692,667
241 S 4,692,668
381 4,692,669
388 4,692,670

CLASS 318

11 4,692,671
116 4,692,672
132 4,692,673
254 4,692,674
4,692,675
269 4,692,676
443 4,692,677
687 4,692,678
696 4,692,679

CLASS 320

2 4,692,680
4,692,681
35 4,692,682

CLASS 322

2 R 4,692,683
90 4,692,684

CLASS 323

263 4,692,686
284 4,692,687
285 4,692,688
313 4,692,689

CLASS 324

61 QS 4,692,685
73 PC 4,692,690
73 R 4,692,691
102 4,692,692
123 R 4,692,693
158 F 4,692,694
158 R 4,692,695
4,692,696
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229 4,692,700
240 4,692,701
251 4,692,702
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309 4,692,767
318 4,692,704
4,692,705
338 4,692,706
374 4,692,707

CLASS 328

63 4,692,708
108 4,692,709
111 4,692,710

CLASS 330

257 4,692,711
261 4,692,712

CLASS 331

1 A 4,692,713
1 R 4,692,714
2 4,692,715
3 4,692,716
111 4,692,717
113 R 4,692,718

CLASS 332

11 D 4,692,719

CLASS 333

33 4,692,720
109 4,692,721
142 4,692,722
202 4,692,723
4,692,724
203 4,692,725
206 4,692,726
219 4,692,727

CLASS 335

192 4,692,728
259 4,692,729
278 4,692,730
299 4,692,731
302 4,692,732

CLASS 337

158 4,692,733
162 4,692,734

CLASS 338

21 4,692,735
198 4,692,805

CLASS 340

81 R 4,692,736
347 C 4,692,738
347 DD 4,692,737
365 P 4,692,739
365 R 4,692,740
392 4,692,741
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550 4,692,744
568 4,692,745
572 4,692,746
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573 4,692,748
574 4,692,749
588 4,692,750
602 4,692,751
604 4,692,752
671 4,692,753
4,692,754
687 4,692,755
709 4,692,756
721 4,692,757
735 4,692,758
748 4,692,759
756 4,692,760
825.01 4,692,761
825.69 4,692,762

CLASS 342

28 4,692,763
71 4,692,764
106 4,692,765
200 4,692,766
368 4,692,768

CLASS 343

700 MS 4,692,769
715 4,692,770
882 4,692,771
899 4,692,772

CLASS 346

1.1 4,692,773
76 PH 4,692,774
118 4,692,775
140 R 4,692,776
4,692,777
145 4,692,778
153.1 4,692,779

CLASS 350

96.12 4,691,982
4,691,983
96.14 4,691,984
96.18 4,691,985
96.21 4,691,986
96.23 4,691,987
4,691,988
4,691,989
96.33 4,691,990
4,691,991
99 4,691,992
105 4,691,993
320 4,691,994
331 R 4,691,995
465 4,691,996
503 4,691,997
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620 4,691,999
637 4,692,000

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CLASS 352

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CLASS 354

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75 4,692,006
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246 4,692,009
273 4,697,010
403 4,692,012
413 4,692,013
471 4,692,014

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4,692,016
3 DD 4,692,017
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14 R 4,692,021
14 SH 4,692,020
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135 4,692,024
345 4,692,026
353 4,692,027

CLASS 357

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23.13 4,692,781
29 4,692,782
42 4,692,783
49 4,692,784
52 4,692,785
54 4,692,786
59 4,692,787
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81 4,692,791

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29 4,692,793
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93 4,692,798
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133 4,692,801
139 4,692,802
143 4,692,803
163 4,692,804
209 4,692,806
229 4,692,807
231 4,692,808
247 4,692,809
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294 4,692,813
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342 4,692,816

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137 4,692,832

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395 4,692,841
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466 4,692,870
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497 4,692,875
513 4,692,876
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518 4,692,878
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571 4,692,883
573 4,692,884
606 4,692,885
718 4,692,886
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728 4,692,888
730 4,692,889
733 4,692,890
763 4,692,891
807 4,692,892
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334 4,692,057

CLASS 404

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CLASS 405

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115 4,692,060
128 4,692,061
141 4,692,062
177 4,692,063
211 4,692,064
4,692,065
216 4,692,066
302 4,692,067

CLASS 406

89 4,692,068

CLASS 407

39 4,692,069
104 4,692,070

CLASS 408

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124 4,692,072
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233 4,692,074

CLASS 411

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353 4,692,079
387 4,692,080

CLASS 414

22 4,692,081
411 4,692,083
429 4,692,082
607 4,692,084
633 4,692,085
635 4,692,086
680 4,692,087
724 4,692,089

CLASS 415

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143 4,692,092

CLASS 416

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547 4,692,103

CLASS 418

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CLASS 420

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CLASS 422

15 4,692,317
16 4,692,316
18 4,692,315
49 4,692,306
58 4,692,307
65 4,692,308
87 4,692,309
144 4,692,311
151 4,692,312
241 4,692,313
265 4,692,314

CLASS 423

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239 4,692,318
242 4,692,319
263 4,692,320
321 R 4,692,323
404 4,692,321
415 A 4,692,322

CLASS 424

1.1 4,692,324
4 4,692,325
15 4,692,326
78 4,692,328
81 4,692,329
85 4,692,330
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88 4,692,332
122 4,692,310
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149 4,692,335
468 4,692,336
469 4,692,337

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292 4,692,108
308 4,692,109
335 4,692,110
388 4,692,111

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293 4,692,342

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443.1 4,692,360

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CLASS 432

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882 4,692,122

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CLASS 441

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443 4,692,460
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449 4,692,462
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414 4,692,484

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100 4,692,486
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139 4,692,489
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371 4,692,491
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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